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CONTENTS AND SUBJECT INDEX

Diuresis in Patients with Congestive Heart Failure. George Herrmann, M.D.; C. T. Stone, M.D.; E. H. Schwab, M.D., and W. W. Bondurant, M.D., with assistance of Margaret E. Cate and Anna W. Herrmann, Galveston, Texas..1647
Discussed by Drs. Thompson and Herrmann.

Prevention of Severe Reactions Following Pyelograms and Kidney Operations. Howard L. Cecil, M.D., Baltimore.....1652

Undulant (Malta) Fever Spondylitis. Jacob Kulowski, M.D., and T. H. Vinke, M.D., Iowa City.....1656

Method for Prediction of Sex in the Unborn. J. H. Dorn, M.D., and E. I. Sugarman, B.S., San Francisco.1659

Disease, Medicine and Surgery Among the American Aborigines. Aleš Hrdlička, M.D., Washington, D. C.....1661

Atelectasis in Pulmonary Tuberculosis. Barnet P. Stivelman, M.D., New York.....1666
Discussed by Drs. Sante, Pancoast, Reynolds, Dubrow, Pierson and Stivelman.

Carcinoma in Situ Contrasted with Benign Penetrating Epithelium. Albert C. Broders, M.D., Rochester, Minn.....1670
Discussed by Dr. Cutler.

Large Cysts of the Spleen. Roy W. Benton, M.D., Milwaukee....1674

Reduced Lumbosacral Joint Space. P. C. Williams, M.D., Ann Arbor, Mich. 1677
Discussed by Drs. Chandler, O'Reilly, Brewster, Sever, Meyerding and Williams.

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Pulsating Exophthalmos. J. L. Campbell, M.D., and J. D. Martin, M.D., Atlanta, Ga.....1683

Gangrenous Appendix Epiploica. H. E. Randall, M.D., Flint, Mich.1684

Gonococcemia with Recovery. A. I. Rubenstone, M.D., and S. L. Israel, M.D., Philadelphia.....1684

Ultimate Results of Thyroidectomy. A. H. Noehren, M.D., Buffalo.1686

A Rapid and More Accurate Method of Determining the Pollen Content of the Air. William W. Duke, M.D., Kansas City, Mo.....1686

COUNCIL ON PHARMACY AND CHEMISTRY 1688

COMMITTEE ON FOODS 1691

EDITORIALS

Insulin and Hunger.....1692

Racial and Dietary Factors in Basal Metabolism 1692

Nobel Prize in Medicine Awarded to Sherrington and Adrian....1693

CURRENT COMMENT

Electric Current and Electrical Medical Apparatus.....1694

MEDICAL ECONOMICS

New Forms of Medical Practice: 6. American People's League....1695

(Subject Index on next page)

ASSOCIATION NEWS 1696

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SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml," Medicolegal; "ME," Medical Economics.

A. M. A. Committee on Scientific Research, grants available 1699
Adenoids, postnasal operations....ab-1729
Adex Tablets 1712
Adrian, Edgar Douglas, awarded Nobel Prize E-1693
Air, pollen in, determining....*1686
American Board of Otolaryngology, examination 1699
People's League ME-1695
Society of Tropical Medicine....1699
Anemia, Pernicious, blood pictures in infancy ab-1726
Anesthesia, human heart in....ab-1729
subarachnoid, experimental....ab-1727
Antiseptic, irradiated oils....C-1710
Appendicitis, pathogenesis....ab-1733
Appendix epiploica, acute gangrenous....*1684
Argyria and Deane's Dyspepsia Pills....1713
Army, U. S., medical officers protest Estrada appointment 1700
Arsphenamines, deaths from, New York...1690
Arteries, carotid, ligation for pulsating exophthalmos *1683

Association News 1696

Bacteremia, gonococcemia with recovery..*1684
Baker, perennial hay fever in, due to flour.1711
Bevan Lecture, Dr. Graham to give....1677
Bile, porphyrin in....ab-1734
Bile Ducts, cancer....ab-1728
Blister bug....1711
Blood, porphyrin in....ab-1734
pressure, new form of charlatanism....1703
transfusion, history of....*1717
transfusion in malignant diphtheria...ab-1734
Blower for determining pollen in air....*1686
Body weight, increasing, with insulin...E-1692
Bone tumors, giant cell....ab-1722

Book Notices 1714

Books Received....Adv. page 40

Breast, accessory mammary gland on right labium majus....ab-1735
Bronchoscopy 1712

Bureau of Investigation....1709

Cancer in situ contrasted with benign penetrating epithelium....*1670
Carbohydrates in relation to disease....ab-1729
Carbon Tetrachloride, poisoning....ab-1736
Cathartic action of molasses....1713
Cerebrospinal Fluid block, diagnosis...ab-1730
Chicago Medical Society, president's night.1697
Child Nutrition Clinic....1700
Children, school, health of, Berlin....1703
Chromate dermatitis from "Protex Metallum" 1712
Colver Lectures 1696

Committee on Foods 1691

Correspondence 1710

Council on Medical Education....1714

Council on Pharmacy and Chemistry....1688

Deane's Dyspepsia Pills and argyria....1713
Death by drowning....1712

Deaths 1707

Dengue 1702
Dermatitis exfoliativa and pemphigus...ab-1733
exfoliativa neonatorum....ab-1731
Diathermy pyrexia in mental disorders..ab-1731
Diathesis, hemorrhagic, relation to tuberculosis 1704
Diet factor in basal metabolism....E-1692
Digitalis, action ab-1725
Diphtheria, malignant, transfusion in...ab-1734
Disease, carbohydrates in relation to....ab-1729
in American aborigines....*1661
Diuresis in congestive heart failure....*1647
Drowning, death by....1712
Duodenum lesions, roentgen diagnosis...ab-1722
Electric shock, first aid....ab-1730
current and electrical medical apparatus E-1694
Embolism, postoperative....ab-1736
Esophagus, "hiatus hernia"....ab-1734
Estrada appointment, medical officers protest 1700
Exophthalmos, pulsating, treatment....*1683
Extremities, lower, vasodilatation in....ab-1725
Fetus, twins' death from hemorrhage....ab-1736
Fever, Mediterranean exanthematic....1702
Fibro-adenoma of accessory mammary gland ab-1735

Foreign Letters 1700

Fort Smith Clinical Society....1696
Fracture, skeletal traction....ab-1730
Gallbladder cancer ab-1728
disease, roentgen diagnosis....ab-1727
George Washington University, appointments 1697
German medical federations....1702
Goiter, exophthalmic, surgical aspect....ab-1731
thyroidectomy, ultimate results....*1686
Gonococcemia with recovery....*1684
Gonorrhea, urethral irrigations under hydrostatic pressure in....1713

Government Services 1700

Graham, E. A., to give Bevan Lecture....1697
Granuloma, venereal, isolated occurrence ab-1736
Hair removal, Koremlu Cream....C-1710
Haldane, J. B. S., lectures at California...1696
Hay Fever, perennial....1711
Headache in linotype operator....1713
Health, program on public health forum...1698
Heart block, electrocardiography....C-1710
beat, new form of charlatanism....1703
congestive failure, diuresis in....*1647
disease in Negro....ab-1721
electrocardiography in anesthesia....ab-1729
rupture with perforation of interventricular septum....ab-1721
Heat production 1704
Hernia, hiatus....ab-1734
Hospitals, approved, by A. M. A....1714
charitable; liability to visitors....Ml-1720
rural, transporting patients to....1705
Hunger and insulin....E-1692
Hygiene, International Congress on....1701
Hypnotoxin from jellyfish....1713
Indians, American, disease, medicine and surgery among....*1661
Infants, simple, inexpensive formula for..ab-1726
nutrition, psychologic aspects....ab-1725
Insulin and hunger....E-1692
Insurance, sickness, Czechoslovakia....1705
sickness, German medical federations....1702
International Congress of Physiology, fourteenth 1704
Congress on Hygiene of the Mediterranean Region 1701
Intestines, acute gangrenous appendix epiploica *1684
cancer, surgery for....ab-1728
obstruction, acute, roentgen diagnosis..ab-1723
rupture caused by auto accidents....ab-1723
Iodized Oil in diagnosis of spinal block..ab-1730
Jaundice, clinical interpretation....ab-1723
Journal of Chemical Physics....1699
Journal of Indiana State Medical Association, new editor....1697
Kidney, dystopia....ab-1722
surgery, preventing severe reactions following *1652
Knee Joint, injuries of tibial collateral ligament ab-1735
Koremlu Cream—a disclaimer....C-1710
Licensure, annual registration due, Oregon.1699
Linotype operator, headache in....1713
Lungs atrophy....ab-1735
cancer, primary....ab-1726
collapse in pulmonary tuberculosis....*1666
Lymphogranulomatosis, subacute inguinal..ab-1732
Malaria, clinical studies ab-1729
in children, sleep disorders in....ab-1732

Marriages 1707

Medical Economics 1695

Medical Practice Acts: licenses, revocation; de facto board....Ml-1720
Medicine, practice, new forms of....ME-1695

Medicolegal 1720

Mediterranean exanthematic fever....1702

Meetings, Coming Meetings....1720

Meningitis, staphylococcic, complicates epidural abscess....ab-1726
Mental Disease, diathermic pyrexia for ab-1731
Metabolism, basal, racial and dietary factors E-1692
Molasses 1713
Mycetoma pedis, case of....1704
Negro, heart disease in....ab-1721
Nephritis, hemorrhagic, dietary protein in ab-1725
relation to lipoid nephrosis....ab-1723
Nerve, auditory, changes in otosclerosis..ab-1730

New and Nonofficial Remedies....1691

New England Surgical Society....1697
New York University, faculty changes....1698

News 1696

Newsboys, physical defects in....1698
Nobel Prize in Medicine for 1932....E-1693
Nurses, public health, Rockefeller Foundation aids school for....1705
Nutrition, psychologic aspects....ab-1725
Olson, P. O., "magnetic healer"....1698
Ophthalmology, lectures in....1696
Otosclerosis, auditory nerve in....ab-1730
Pemphigus and dermatitis exfoliativa..ab-1733
Peptic Ulcer, etiology....ab-1727
gastric, various stages....ab-1733
study ab-1729
Peritonitis, traumatic....1712
Physical Defects in newsboys....1698
Physicians, German, federations of....1702
Physiology, Fourteenth International Congress of 1704
Poliomyelitis in Iceland in 1924....ab-1736
Pollen content in air, determining....*1686
"Portuguese man-o'-war" or jellyfish....1713
Pregnancy, anemia of....ab-1729
toxemias of ab-1724
"Protex Metallum," chromate dermatitis from 1712
Puckner, William August....1688
Puerto Rico Journal of Public Health and Tropical Medicine 1700
Purpura, thrombocytopenic, postsplenectomy shock ab-1724
thrombopenic, irradiate spleen for....ab-1734
Pyelogram, preventing severe reactions after *1652

Queries and Minor Notes....1711

Race factors in basal metabolism....E-1692

Radio Program 1696

Rats, methods of deratization of ships....1702
Red Cross, transporting patients to rural hospitals 1705
Reticulo-Endothelial System and operation ab-1734
Rheumatism costs England $100,000,000 a year 1701
Rickets and light susceptibility....ab-1734
Rockefeller Foundation annual report....1699
aids school for public health nurses....1705
Sattler, Louis....C-1710
Schulz, Otto, death....1706
Sciatica, reduced lumbosacral joint space..*1677
Scleroderma and its pathogenesis....ab-1735
Sex prediction, method....*1659
Shanklin, E. M., to be editor....1697
Shellfish, ban on, Florida....1697
Sherrington, Charles Scott, awarded Nobel prize E-1693
Sleep, disorders in children with malaria ab-1732
Ships, methods of deratization....1702

Society Proceedings 1720

Southern Medical Association....1699
Specialists, diplomas for, Belgium....1706
Speech, stuttering....1711
Spine, reduced lumbosacral joint space....*1677
undulant fever spondylitis....*1656
Spirochetosis, Spanish 1701
Spleen irradiation for purpura....ab-1734
large cysts....*1674
Splenectomy, shock after....ab-1724

State Board Examinations....1714

Stomach, cancer....ab-1728
subtotal resection....ab-1722
Streptococcus antiserum, possibility of fatal anaphylaxis from....1712
Sulpharsphenamine: uses and limitations...1688
Surgery, reticulo-endothelial system and operation ab-1734
Syphilis, congenital, acetarsone orally...ab-1726
in American aborigines....*1661
in new-born, liposoluble bismuth salts for ab-1731
treatment, sulpharsphenamine....1688
Tachycardia, ventricular ab-1721
Testicle, cancer with superacute abdominal syndrome ab-1732
Theelin injections, possibility of fatal anaphylaxis 1712
Thrombo-Angiitis obliterans abdomen..ab-1735
Thrombosis, postoperative....ab-1736
Thyroidectomy, ultimate results....*1686

Tonics and Sedatives....Adv. page 34

Tonsillectomy, time for effect of local anesthetic in 1713
Tonsils and postnasal adenoid operation..ab-1729
Trachoma, vaccine for secondary infections in 1704
Tuberculosis and leukocyte picture deviation ab-1733
hemorrhagic diathesis in relation to....1704
in children 1700
mortality high among Scots....1701
mortality in Norway....ab-1736
pulmonary, atelectasis in....*1666
pulmonary, cavern near hilus....ab-1733
pulmonary, treatment, oxygen....ab-1722
Tuck, Mr., honored by Paris....1702
Tumor, giant cell....ab-1721; ab-1722
Twins, death of, from hemorrhage....ab-1736
Undulant Fever, pathology....1701; ab-1735
spondylitis *1656
Urethra, irrigations in gonorrhea....1713
Varicose Veins, mechanics of reverse blood flow in ab-1728
Veterans, hospitalization of....1699
Vision, testing, in varying degrees of illumination 1703
Vitamin A, Adex Tablets....1712
Vomiting, acetonemic, cause of death...ab-1732
Vulva, fibro-adenoma of accessory mammary gland on ab-1735
War injured, number, in Germany....1703
Welfare practice, Germany....1703
Workmen's Compensation Acts, Czechoslovakia 1705
Wounds, healing, effect of irradiated oils C-1710

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DIURESIS IN PATIENTS WITH CONGESTIVE HEART FAILURE

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WITH THE ASSISTANCE OF MARGARET E. CATE AND ANNA W. HERRMANN

GALVESTON, TEXAS

The mechanisms by which diuresis is accomplished by the various therapeutic regimens and the various specific diuretics are still only partially understood. There are sharp differences of opinion not only as to the mode of action, but also as to the point of action of the drugs. Within the last few years much experimental evidence has been advanced, principally by the German investigators [1] and their American followers,[2] to prove that the effects of the specific diuretics are primarily exerted on the tissues and that the traditional conception of the principal effect of the action of diuretics on the kidney is perhaps in error.

The importance of edema as a clinical therapeutic problem cannot be overstressed. There are considerable clinical data and some experimental evidence that the presence of edema is distinctly disadvantageous, and it seems almost beyond peradventure that the dropsical state adds measurably to the burden of the heart in congestive heart failure. The striking clinical improvement in circulatory efficiency and the fall in rate of the sinus tachycardia, as well as the relief of the dyspnea following profuse diuresis, are commonly observed in response to the induction of acidosis or the use of the mercurials, neither of which is known to have any direct beneficial effect on the heart or the pulmonary circulation.

The justification of studies directed toward the elucidation of any of the factors concerned in the problem of deranged water metabolism is quite apparent. As clinicians we are chiefly concerned in the dissipation of edema fluid that has accumulated in the subcutaneous tissue interstices and in the body cavities and has created what is almost akin to a vicious circle. To establish the optimal conditions under which the various therapeutic agents act most safely, promptly and efficiently is, of course, a high goal to which few have the audacity to aspire, but as we proceed with the philosophy of the star hitcher even though complete success cannot be hoped for, some advance may be accomplished.

Besides the practical aspects, the intriguing theoretical considerations command attention. Before one can hope to determine the most favorable conditions predisposing to efficacious therapeutic action, one must be able to visualize the processes fairly clearly and have an understanding of the mechanisms that cause abnormal amounts of fluid to accumulate in the subcutaneous tissues. We should like to know what detectable and measurable changes take place to induce the onset and maintain the continuance of a diuresis with its accompanying mobilization and transportation of salt and water. The rôle played by the blood proteins in the maintenance of the osmotic or oncotic pressure of the blood plasma and the delicacy or fineness of the balance has only within the last year or so been fully realized. A change effected in these colloidal constituents may be quite as significant or even more so than the electrolyte shift, which may well be a secondary matter.

The point of effective diuretic action of the older pharmacologic agents may be primarily circulatory, general and local on the coronary circulation, but quite as likely, also, on the renal glomerular circulation. Again the effects may be on the arteriolar and capillary walls and system in the water-clogged tissues or as a humoral reaction in the blood plasma proteins or electrolytes, or on these same or similar constituents in the edematous fluids. These apparently widely different possible effects may be correlated in combinations that vary only slightly from time to time. Unfortunately, there are thus introduced many variables which make the studies of the phenomenon of diuresis most capricious. In a clinical study we can hope only to determine a few of the factors concerned, for it is manifestly impossible to follow simultaneously all of the shifts of physical and chemical changes that are taking place in the capillaries, blood plasma and edema fluids, the heart and the kidneys. Our plan of experimental procedure can be only as expansive as our limited facilities will permit.

Extrarenal factors, it must be admitted, are strikingly at work in the accumulation of edema in the dropsical state of congestive heart failure. The venous stasis, with increased intravascular pressure, and the anoxemia,

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From the John Sealy Hospital and the Department of Medicine of the University of Texas.

Read before the Section on Pharmacology and Therapeutics at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

1. Saxl, P., and Heilig, R.: Wien. klin. Wchnschr. **33**: 943 (Oct. 21) 1920; Wien. Arch. f. inn. Med. **3**: 141 (Nov.) 1921; Ztschr. f. d. ges. exper. Med. **38**: 94, 1925. Kollert, V.: Therap. d. Gegenw. **22**: 340, 1920. Eppinger, H.: ibid. **23**: 81, 1921. Brunn, F.: München. med. Wchnschr. **68**: 1554 (Dec. 2) 1921; Wien. klin. Wchnschr. **37**: 901 (Sept. 11) 1924. Recht, G.: ibid. **39**: 1046, 1926. Schlayer, C. R.: Ztschr. f. ärztl. Fortbild. **21**: 1, 1924. Veil, W. H.: Klin. Wchnschr. **3**: 1609 (Sept. 2) 1924.

2. Crawford, J. H., and McIntosh, J. F.: J. Clin. Investigation **1**: 333 (April) 1925. Keith, N. M.; Barrier, C. W., and Whelan, Mary: The Diuretic Action of Ammonium Chlorid and Novasurol, J. A. M. A. **85**: 799 (Sept. 12) 1925. Keith, N. M., and Whelan, Mary: J. Clin. Investigation **3**: 149 (Oct.) 1926. Curtis, G. M.: Biochem. Ztschr. **186**: 95, 1927; The Action of the Specific Diuretics, J. A. M. A. **93**: 2016 (Dec. 28) 1929.

with its resulting effect on the capillary wall, increasing its permeability, and the consequent ease of filtration must be chief factors in the origin of cardiac edema. How much congestion of the kidney interferes with the elimination of salt and water is not often considered. A decrease in the osmotic or oncotic pressure of the blood plasma due to a reduction in the colloidal serum albumin may be a minor factor. We [3] and others [4] have shown slightly lowered albumin levels to be the rule in edematous invalids with cardiac disease; however, the values found barely approach the critical edema levels. Then, too, the dehydration of the waterlogged patient is accompanied by a slight, if any, rise toward normal values.

While the development of edema can easily be explained and visualized as primarily a peripheral affair, it is most difficult to conceive of chemical and physical changes in tissue fluid or perhaps metabolic effects as the first and chief factors to initiate and carry on a diuresis and thus form the chief basis for the dissipation of edema. Even a hypothetic, effective, peripheral, vascular, permeability change, which is generally suggested as the cause, though likely, seems

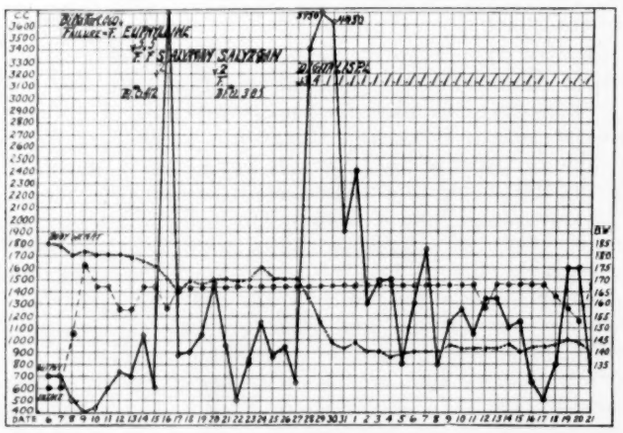

Chart 1.—Clinical observations over a period of forty-eight days on a patient (Sandy Jones, case 1) with hypertensive cardiovascular disease in extreme congestive heart failure. Note the failure of response on two occasions to theophylline-ethylenediamine administered intravenously, the satisfactory result from the initial administration of salyrgan and the subsequent failure three days later, and the prolonged diuresis following digitalization.

far-fetched. The evidence for a primary tissue modus operandi for the inauguration and maintenance of diuresis is not definitely conclusive, notwithstanding the experimental studies and quoted clinical supportive facts in the cases of hepatic disease.

Some of the older therapeutic agents that are generally successful in relieving the body of edema have been shown to have definite effects on the circulatory mechanism and can be quite easily conceived of as having similar effects on the glomerular circulation, and in such action they may be considered as precipitating the conditions that initiate the diuresis. That is, of course, harking back to a primary renal effect of these therapeutic agents.[5] The maintenance of the increased urinary flow and the consequent drainage of the subcutaneous tissues we believe depend on secondary physicochemical blood plasma colloid and electrolyte changes; the call on the tissues to yield up their accumulated salts and fluid in the attempt to sustain the oncotic equilibrium in the plasma and the reestablishment of body water equilibrium seems to be secondary.

3. Herrmann, George: Tr. A. Am. Physicians **46**: 360, 1931; South. M. J. **25**: 934, 1932.
4. Payne, S. A., and Peters, J. P.: J. Clin. Investigation **11**: 103 (Jan.) 1932.
5. van Schroeder, W.: Arch. f. exper. Path. u. Pharmakol. **24**: 85, 1888.

GENERAL OBSERVATIONS

We have made clinical studies along with chemical urine and blood analyses which, we believe, support the traditional conception of a primary renal effect of the diuretics when administered to patients with extreme congestive heart failure. Earlier studies [3] consisted in making preliminary clinical observations on the degree of edema, weight and output of urine on a standardized total intake of 1,500 cc. of fluid and a low protein, salt-poor diet with chemical analyses of the blood for serum proteins, calcium, phosphorus, potassium, chlorides and urea and similar urinalyses. The studies were carried out at the height of edema and again at the end of the clinical diuretic study. After the diuretic had accomplished the elimination of abnormal accumulations of subcutaneous fluid, the blood and urine analyses were repeated.[3] Obviously, such a plan would show only striking and persisting changes, and as a result the intervals between studies varied greatly, and the yield of information was slight.

The occasional instance of failure of response to the diuretics (chart 1), it was hoped, would shed some light on the chemical conditions of the blood unfavorable to effective diuresis. The rarity of such failures contributed to the paucity of the desired data. It seemed that low blood chloride levels foreboded failure of the xanthine group, which usually gave a conspicuous response with profuse diuresis in edematous patients with normal or elevated blood chloride levels. High calcium levels seemed to be less favorable for diuresis from the use of digitalis bodies, which were more regularly effective in the instances with lower blood calcium levels. The mercurial diuretics were more generally effective, especially in the presence of high values for blood calcium. These fragmentary findings cannot in any way be considered the basis for conclusions, but they have served to stimulate our interest in more carefully controlled and more completely studied clinical experiments.

It was evident that some conception of the mechanism of urinary secretion and diuresis in congested kidneys was necessary before any insight into the most favorable conditions for diuresis could be hoped for. We determined, therefore, to apply the creatinine method that Rehberg [6] used on himself in the study of normal renal function in man and in securing the evidence for his ultramodern theory of the secretion of urine. Schmitz and Leiter [7] have studied the effects of diuretics on the kidney of normal dogs by the same method.

SPONTANEOUS DIURESIS (CHARTS 2 AND 3)

The first precaution in the study of diuresis in edematous patients with congestive heart failure, even in a relatively crude clinical investigation, is to obviate the confusing effects of the spontaneous diuresis of rest in bed, the consequent cardiac rest and the presumable incalculatable circulatory readjustment.

Spontaneous diuresis occurs quite frequently and must always be taken into consideration. We have found that practically always the effects of physical rest alone will be apparent within three days, and we have therefore always considered the first three days of

6. Rehberg, P. B.: Biochem. J. **20**: 447, 1926.
7. Schmitz, H. L., and Leiter, L.: J. Clin. Investigation **10**: 665, 1931.

hospitalization a period of stabilization and control. The diet is a standardized low protein (40 Gm.) and low salt (2 Gm.) regimen with a fluid supply of 1,500 cc. The body weight and blood pressures are recorded daily. In this study we encountered six instances of spontaneous diuresis, in two of which the circulatory readjustment overnight seemed to have relationship to nothing other than rest in bed in the hospital. The other four cases occurred in patients in prolonged acute asthmatic seizures associated with acute obstructive vesicular emphysema, in whom the right ventricular failure seemed to be definitely related to the increased intrapulmonary pressure against which peripheral obstruction the right side of the heart had to work. Epinephrine, ephedrine and synephrin seemed to be but little, if any, better than morphine, atropine, homatropine or rest alone.

In a group of four cases of a similar type of congestive heart failure accompanying a peculiar type of bronchiolitis, the most effective antispasmodics gave little relief and in fact seemed to aggravate the heart failure, with pulmonary thrombosis and death as a result. In the fourth or last case, however, therapy was directed against the edema and not against the bronchial spasm primarily. In this instance theophylline-ethylenediamine was given intravenously, and acute profuse diuresis resulted; with the improvement in the circulation, the pulmonary symptoms gradually cleared up. The importance of getting rid of edema to give the overburdened heart a chance to reestablish circulatory equilibrium was again clearly demonstrated.

MECHANISM OF ACTION OF DIURETIC DRUGS IN PATIENTS WITH CONGESTIVE HEART FAILURE AS REVEALED BY CREATININE METHOD[6]

Patients with congestive heart failure were prepared as described, and were allowed three days of rest in

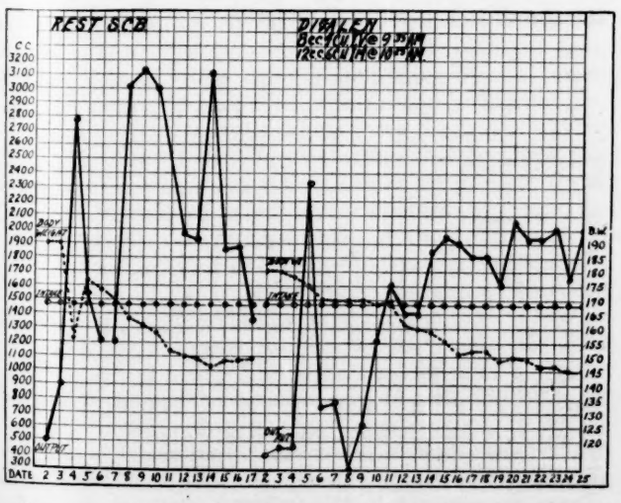

Chart 2.—A clinical chart of two admissions of a patient (Leander Smith) with coronary artery disease and failure, contrasting a "rest" diuresis with that resulting from digitalization.

bed to establish an equilibrium and to insure against interfering or confusing spontaneous increases in urinary output resulting from this regimen. On the fourth day or later, the acute diuretic experiments were performed. Control samples of blood and urine were taken for analysis, and 5 Gm. of creatinine in 200 cc. of warm water was administered to raise the level of blood and urinary creatinine. Within an hour the maximal level in the blood is usually reached, and samples of blood and urine are again collected, and the diuretic is then administered intravenously. Continuing the routine intake of 180 cc. of water every two hours and the low protein, salt-poor diet, samples of blood are taken each time urine is voided (approximately hourly intervals), the blood being taken preferably about ten minutes before the urine, and all urinary output is carefully collected and the minute volume calculated (U).

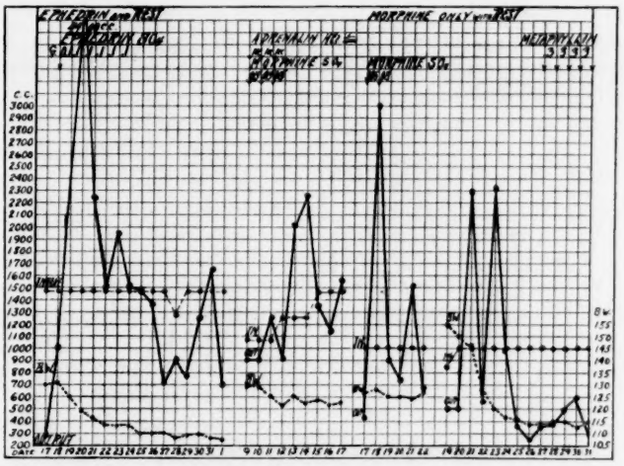

Chart 3.—Four examples of spontaneous diuresis in patients with asthmatic bronchitis associated with acute vesicular emphysema and right ventricular failure. Note that in each instance the diuresis was well marked by the third day.

Creatinine is assumed by Rehberg to be a total non-threshold substance filtered through the glomerulus but not diffusing or being absorbed by the tubular epithelium, and therefore its concentration in the urine as contrasted to that in the blood is taken as the index of concentration (C) of the glomerular filtrate as it passes through the proximal and distal convoluted tubules and is excreted in the urine. With this index calculations are made of the amount of fluid filtered through the glomeruli (F), which equals C × U. The volume of reabsorbed fluid (R) is equal to F — U. By the interjection of the determined percentage levels of chlorides and urea in the urine and blood the concentration ratios of these substances are determined. Thus, further calculations give the amount of filtered chlorides (F Cl), which equals $\frac{F \times Cl\ s\%}{100}$; filtered urea (F U), which equals $\frac{F \times U\ s\%}{100}$; the excreted chlorides (U Cl), which equal $\frac{U \times Cl\ U\%}{100}$; the excreted urea (U u), which equals $\frac{U \times U\ u\%}{100}$; the reabsorbed chlorides (R Cl), which equal F Cl — U Cl; the reabsorbed urea (R U), which equals F U — U u; the percentage of chloride in the reabsorbed fluid (C R%), which equals $\frac{R\ Cl}{R} \times 100$ and the percentage of urea in the reabsorbed fluid (U R%), which equals $\frac{R\ U}{R} \times 100$; the percentage of the total filtered chloride that is excreted (E Cl%), which equals $\frac{U\ Cl}{F\ Cl} \times 100$, and that of urea (E U%), which equals $\frac{Uu}{Fu} \times 100$. The percentage means milligrams per hundred cubic centimeters. Cl represents the chlorides determined as sodium chloride and U as urea nitrogen.

The method used for creatinine in the whole blood or serum was that of Folin and Wu; for urinary creatinine, the modified microchemical method of Folin; for blood chlorides, the Whitehorn method, and for urinary chlorides, Harvey's simplified procedure of

Volhard's technic, the Whitehorn standard being used. Urea in the blood and urine was determined by Lieboff and Kahn's pressure hydrolysis method.

APPLICATION OF THESE METHODS TO THE STUDY OF DIURESIS OF EDEMA

It is thus apparently possible to determine the means by which the increased output of urine is accomplished. It is conceivable that diuresis may result from an opening up of all the glomerular units, from 10 to 40 per cent of which may be idle under normal circumstances. Increased glomerular filtration with a concomitant slight decrease in the percentage of tubular reabsorption may be at work. A greatly decreased tubular reabsorption with normal or even subnormal glomerular filtration levels or variable combinations of these may be the cause of an increased outflow of urine.

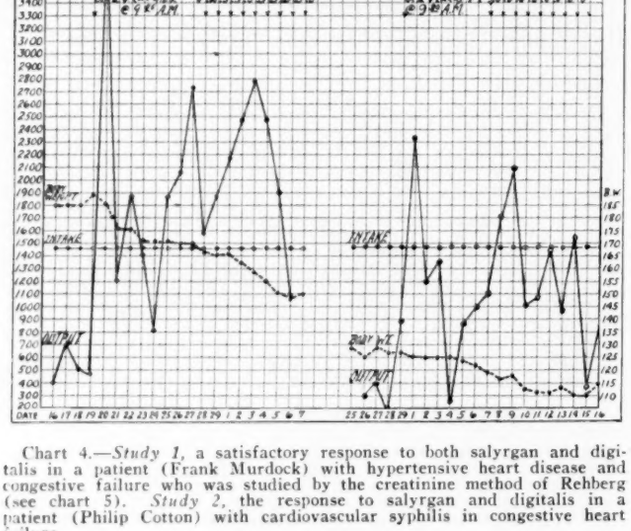

Chart 4.—*Study 1*, a satisfactory response to both salyrgan and digitalis in a patient (Frank Murdock) with hypertensive heart disease and congestive failure who was studied by the creatinine method of Rehberg (see chart 5). *Study 2*, the response to salyrgan and digitalis in a patient (Philip Cotton) with cardiovascular syphilis in congestive heart failure.

THE PRESENT STUDIES

In twelve instances of congestive heart failure with edema the regimen outlined has been carried out, various diuretics having been used. In one case digitalis as the powdered leaf in rather massive dosage (1.5 Gm.), reinforced by digalen intramuscularly (6 cat units, or 12 cc.), was given; in another case digalen (4 cat units, or 8 cc., intravenously and 6 cat units, or 12 cc., intramuscularly) was administered, and in still another case ouabain, 0.25 mg., was given intravenously. In four studies theophylline-ethylenediamine (0.96 Gm., or 4 cc., in 10 cc. of physiologic solution of sodium chloride) was used, two doses being given intravenously one hour apart. Mersalyl, or salyrgan, was slowly injected intravenously in 0.2 Gm., or 2 cc., doses into four edematous patients. In two patients all three types of diuretic drugs were employed to make comparisons of the effects of the various drugs in the same person. They were used in different order, however, with the result that evidences suggesting cumulative effects were noted. The effects of digitalization were not as spectacular or as prompt as the occasional spontaneous diuresis or that induced by theophylline-ethylenediamine. It closely resembles the latter, but the diuresis usually is not so profuse as that produced by mersalyl, which is of a type that is apparently primarily and fundamentally different.

Digitalis and theophylline-ethylenediamine seemed to produce primarily a striking increase in glomerular filtration and apparently secondarily some defective tubular reabsorption. Mersalyl, on the other hand, provokes no increase in glomerular filtration, but does sharply and conspicuously reduce tubular reabsorption and thus greatly augments the urinary output per minute. The somewhat contrasting effects are graphically shown in charts 5 and 6. The effect of digitalization or a xanthine derivative, like that of rest in the case of edematous heart failure, is quite conceivably one of improved renal or, more specifically, glomerular circulation, perhaps the result of vasodilatation which with theophylline is renal as well as coronary and thus is indirectly also secondarily effective. This vasodilatation permits increased glomerular filtration, and the rapid flow continuing through the tubular capillary bed does not permit the reabsorption to keep pace with the increased filtration, and the consequent lag further increases the urinary output.

The mercurial diuretic action is apparently of a different nature. Defective reabsorption of electrolytes and water, interference with the backward diffusion through the tubular epithelium into the blood plasma of the tubular capillary plexus, seems to form the basis for the diuresis. How serious or how prolonged this depression of the tubular epithelium may be following the use of the mercurials is an important question. In two patients who died and who had received for some time mercurial diuretics, there was found, besides extensive liver damage, extreme tubular degeneration, destruction and necrosis. In combination studies we have been able to use all types of diuretics in two patients and have changed the order of administration and found persistence of effects. This was especially noteworthy and conspicuous when the mercurials were used first in the series. The reabsorption defect persisted and consequently augmented the diuresis that the xanthine's increased filtration had provoked. The depressing mercury effect on the tubular epithelium seems to persist for several days, and so defective reabsorption can be demonstrated, as can also the more persistent tonic circulatory effects of digitalization. The results that we have obtained are strongly in favor of a primary renal effect of the various diuretics. There seems to be some evidence that rest, digitalis and the xanthine diuretics act by virtue of the circulatory changes produced in the glomerular tuft and the tubular

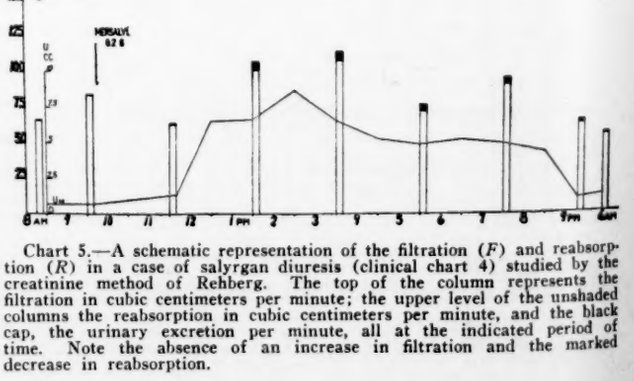

Chart 5.—A schematic representation of the filtration (*F*) and reabsorption (*R*) in a case of salyrgan diuresis (clinical chart 4) studied by the creatinine method of Rehberg. The top of the column represents the filtration in cubic centimeters per minute; the upper level of the unshaded columns the reabsorption in cubic centimeters per minute, and the black cap, the urinary excretion per minute, all at the indicated period of time. Note the absence of an increase in filtration and the marked decrease in reabsorption.

capillary bed and that the mercurials have some depressing action on the tubular epithelium as soon as they begin to diffuse through or to be absorbed by these cells.

CHEMICAL DATA ON THE BLOOD AND URINE

A survey of our chemical findings gives us certain suggestions. The carbon dioxide combining power of the blood drops rather sharply, presumably the result of loss of base washed out in the urine. The fall is sharpest and most pronounced after the intravenous

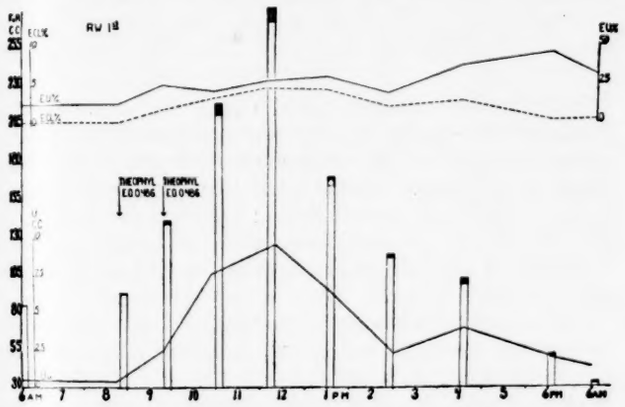

Chart 6.—A chart similar to the preceding one, showing the filtration and the reabsorption in the diuresis following the intravenous injection of theophylline-ethylenediamine. The clinical chart of this patient is chart 7. Note the striking increase in filtration and the associated decrease in reabsorption. Contrast with chart 5.

injection of the mercurials, and the acidosis may be in part due to the chemical changes induced. Blood volume as determined by hemoglobin, hematocrit and serum protein dilutions was but slightly changed in the few instances in which all of these estimations were carried out. Of all the electrolytes, the chlorides seem to be the most important in diuresis. There seems to be a slight fall in serum chloride accompanying and rather consistently following the intravenous introduction of a diuretic into edematous patients with cardiac disease. The drop in the level of the serum chlorides seems to come with the first indication of the increased urinary output; then there is a rise during which the bulk of the diuresis occurs. A washing out seems to result in a second drop and a subsequent rise in blood chlorides, while the chlorides in even the highly diluted urine remain high. A third fall in blood chlorides, perhaps an exhaustion phenomenon, is sometimes found. Similar but slighter and slower shifts in the levels of the blood urea have been noted. The rise in blood urea seems to be higher following the xanthine injections. The urea reabsorption is interfered with during the diuresis, and E U%, the excreted part of the filtered urea, rises and persists at higher percentages even in instances in which only slight chloride changes have occurred. The reabsorption of chlorides is most severely affected by the mercurials, and the E Cl%, the excreted part of the filtered chlorides, rises with diuresis and remains somewhat increased sometimes for as long as two days after the diuresis. These changes are not as marked or as persistent with theophylline and digitalis preparations.

COMMENTS IN SUMMARY

Some of the problems of disturbance in the gross water and salt metabolism in edematous patients with congestive heart failure are restated.

The clinical approach to the investigation of these problems is outlined. The importance of the spontaneous diuresis of rest and that afforded by relief of intrapulmonary tension and the accompanying increase in the blood pressure in the lesser circuit is stressed.

The possible relationship of the levels and shifts of serum calcium, inorganic phosphorus and potassium, determined previously, to the efficacy of a diuretic is mentioned but not further discussed. The occasional failure of response, if intensely studied, may yield valuable information.

The possible modes of action of the specific diuretics are assembled, and the rationale of the traditional conception of the renal action with slight modification, emphasizing the circulatory basis especially for digitalis and the xanthine derivatives in congestive cardiac failure, is pointed out.

The creatinine method of Rehberg is described, and the results of the application of this method to the study of the point and mechanism of the action of diuretics in edematous myocardial invalids are given.

Rest, digitalis and theophylline-ethylenediamine apparently result in augmented glomerular tuft and tubular capillary circulation, with a consequent increased glomerular filtration and a concomitant slightly impaired or less efficient tubular reabsorption to account for the increased urinary output.

Mersalyl, or salyrgan, seems to produce diuresis primarily by depressing the cells of the tubular epithelium, thereby hampering diffusion or reabsorption, while filtration is little if at all affected. The defective reabsorption is great enough to account for the diuresis.

The chemical shifts in the blood, urine and tissue fluids apparently responsible for the mechanisms are stated. There seems to be a definite drop in the carbon dioxide combining power of the blood due, in part at least, to a loss of base in the urine. The chloride shifts are most marked. There is apparently an initial fall

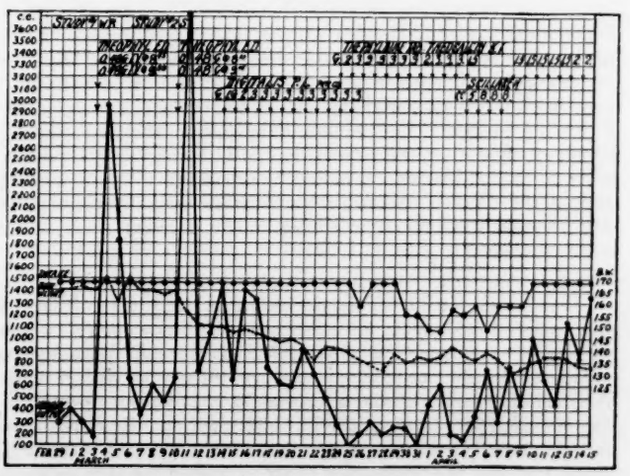

Chart 7.—The clinical chart of a patient (Robert Wilson) with arteriosclerotic heart disease and congestive heart failure studied by the creatinine method of Rehberg (see chart 6) first with whole blood and secondly with blood serum during two acute theophylline-ethylenediamine diuretic periods. Note the slower or less spectacular response to digitalization.

in the blood chloride level, in part perhaps a dilution phenomenon, and then a sharp rise with great amounts of chloride continuing to be excreted in the urine throughout diuresis. The blood urea values frequently rose, and the amount in the urine increased. The reabsorption of chlorides and urea was apparently interfered with, particularly in the cases in which mercurials were used. From our studies it appears that the action of diuretics is primarily on the kidney and only secondarily on the tissue fluids.

ABSTRACT OF DISCUSSION

DR. WILLARD O. THOMPSON, Chicago: I congratulate Dr. Herrmann and his associates on securing satisfactory control periods before the diuretics were given. There appears to be no doubt from their charts that an actual increase in the output of urine resulted from these various diuretics. However, I wonder whether three days is always sufficient time to exclude the possibility of a spontaneous diuresis. It would be interesting to know the effect of theophylline and mersalyl in patients with marked cardiac decompensation which fails to respond to prolonged rest and digitalization. I have always regarded the edema in patients with failing hearts as a secondary affair. This conclusion was strengthened by some observations made concerning the effect of posture on the circulation. If a normal man stands still for thirty minutes, after a rest in the recumbent position, he may lose as much as 500 cc. of practically protein-free fluid from his plasma. In association with this change there is a decrease in the output of the heart and an increase in the diameter of the calves of the legs. These changes may be attributed to the mechanical difficulty of returning blood to the heart and an increased venous filtration pressure in dependent portions of the body. In patients with heart failure there is also a marked increase in the venous pressure, and in at least one type a diminution in the output of the heart has been noted. As would be expected on mechanical grounds, the edema usually appears first in dependent parts of the body, and, in the beginning, may disappear during the night's rest in bed. So far as the edema is concerned, the fundamental pathologic change would appear to be an increased venous pressure, as a result of which water is unable to get into the venous side of the capillaries at an adequate rate. To be sure, complicated physicochemical changes occur in the blood and the body tissues, but these would seem to be secondary to the increase in venous pressure. Such observations lead one to wonder whether the kidney may not play a secondary rôle in cardiac edema. Of course, the nutrition of the kidney may be impaired and, as a result of this, changes in function may occur; but the primary reason for change in function would appear to be the poor circulation. This would make it all the more interesting if it could be demonstrated that diuretics actually work by affecting the kidney. Christian has recently shown that, when a diuretic is injected into a renal artery of the dog, the output of urine, while increased from both kidneys, is increased more from the injected side. There are three possible ways in which diuretics may work: (1) by direct action on the kidney, (2) by direct action on the heart, theophylline having such an effect, and (3) by direct action on the tissues, e. g., by changing the permeability of the capillaries. I should be interested to know whether any of the diuretics increase the number of glomeruli in use. That simple mechanical alteration might explain some of the changes observed.

DR. GEORGE R. HERRMANN, Galveston, Texas: In answer to Dr. Thompson, I think the point is well taken that the accumulation of edema is a peripheral phenomenon; on that we agree, but that the elimination is a renal phenomenon, enhanced by the general circulatory effects of these drugs. We feel that most of them, especially the digitalis group and the theophylline, are primarily effective on the circulation, and the renal circulation takes part in the general increase in circulation and the elimination is accomplished through increased renal circulation with the mercurials. The only evidence we have is strongly suggestive of a definite effect on the tubular epithelium. We have had two instances in which patients died following mercurial drugs and the pathologist has reported complete destruction of the tubular epithelium. These patients did not have diuresis. The explanation may be that, when the tubular epithelium is destroyed completely, the permeability is increased and not decreased as it is in the therapeutic effect of the drug. On the question as to the mechanism of the glomeruli, the open glomeruli, we have not made any experiments. The proteins have been followed in some instances. There have been no great shifts in proteins so far as we have been able to determine during the period of acute diuresis, and the blood volume shift is slight but may be effective enough to open up more glomeruli for diuresis. But the fact that the changes are those of dilution suggest that the mechanism is primarily one of increased filtration through the glomeruli that are already open and decreased reabsorption, and that the third part does not come into play. I think it is probably a combination of the various mechanisms and probably some increase in the number of glomeruli open. It would be interesting to follow out those experimental studies.

PREVENTION OF SEVERE REACTIONS FOLLOWING PYELOGRAMS AND KIDNEY OPERATIONS

HOWARD L. CECIL, M.D.
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Many severe reactions and not a few deaths have followed pyelograms and kidney operations. It would seem that these severe reactions and fatalities are many times preventable. This is particularly true since it has been proved that an intrapelvic pressure exceeding 20 mm. of mercury is dangerous, and that as the pressure is increased the danger is increased in almost geometric progression.

The deaths following pyelography have decreased, but severe reactions still occur, and most often in cases of severe infection when the pelvis is of normal size or is contracted. When colloidal solutions were used and death followed pyelography, some of the solution was found in the liver and lungs. The explanation for this was not forthcoming until Hinman and Lee-Brown[1] published their work on pyelovenous backflow. It seems proved beyond all doubt that too much pressure within the kidney pelvis ruptures the mucosa, and the solution escapes into the venous system. If this solution is toxic and a lethal dose is given, death follows.

It is somewhat indefinite as to what constitutes too much pressure. Lee-Brown, working with cadavers' kidneys, said, "Pyelovenous backflow occurred in as low as 20 mm. of mercury." Trout, working with cadavers' kidneys, said, "All of the normal, well preserved kidneys withstood pressures of at least 120 mm. of mercury without rupture." Again he said, "In these experiments all the kidneys used appeared to a trained pathologist to be normal upon gross inspection, and yet some of the kidneys ruptured at pressures which were as low as 30 mm. of mercury."

It would seem wise, then, to keep the pressure below 20 mm. of mercury since it is reported that some kidneys do not withstand more than this. At all events, pain should not be produced by the injection into the kidney pelvis. If anything, the use of nontoxic solutions has had a tendency to make operators more careless, and probably overdistention is as prevalent today, or more so, than it formerly was. This overdistention would amount to very little today if the pyelographic solution were the only consideration. But many of the patients who undergo pyelography have badly infected kidneys. The pelvis and calices are filled with pus and bacteria, suspended in a urine in many instances foul as a result of bacterial decomposition. Even though the pyelographic mediums may be injected intravenously in large quantities with impunity, it does not follow that foul, bacteria-laden urine can be. There is no explanation for the severe chills and the high temperature following pyelography except infection, and this infection in the majority of cases enters the blood stream through a ruptured calix. W. W. Scott found that elevations of temperature following urethral manipula-

1. Hinman, Frank, and Lee-Brown, R. K.: Pyelovenous Backflow, J. A. M. A. **82**: 607 (Feb. 23) 1924.

tions and operations were caused by or accompanied by an infection of the blood stream. It cannot be proved that the infection enters the blood stream as a result of a ruptured calix, but it is more than reasonable to suppose that this is the case. To cite a few cases of severe reactions following pyelography would be an entire waste of time and space. Every urologist has had such reactions in his practice and mentions them when reporting kidney conditions in which pyelograms were necessary. It therefore would seem that pyelographic mediums should be injected with the greatest care in infected cases, as a fatal blood stream infection may follow, and surely many severe reactions can be prevented by this precaution.

There is another practical application of this phenomenon of pyelovenous backflow. I report three cases which I believe demonstrate forcibly that precaution should be exercised in operations on pyonephrotic kidneys and particularly on tuberculous pyonephrotic ones. It is emphasized in writings on kidney surgery not to soil the wound with infected material within the kidney. This is particularly true in cases of tuberculosis. Yet, in spite of all sorts of opinions and precautions, a goodly number of the wounds are infected and many break down if the kidney is tuberculous. It is impossible to prevent infection of a large number of the wounds. This does not, however, constitute an excuse for carelessness. It is the common custom, in trying to prevent infections of the wound, to tie the ureter first and then remove the kidney. By doing this, if the pelvis contains pus and strong traction is made on the kidney, the intrapelvic pressure is greatly increased and may result in rupture of a calix into a vein (pyelovenous backflow). This causes a blood stream infection which is extremely serious and even fatal.

In an article in which Dr. George Walker cautioned against squeezing the kidney, he said:

> In certain pathological specimens I have noted a very intimate communication between the disease process and the blood vessels and the lymphatics; and it has occurred to me that squeezing, or otherwise contusing the organ, might very readily force the diseased tissue into those vessels and thence into the circulation. In substantiation of this theory may be adduced numerous clinical observations of cases in which the patients developed an acute tuberculosis, almost immediately after the operation. In one of my own cases the patient had a temperature on the second day of 102 F. and subsequently showed a general tuberculosis from which he died in two months. Another such instance I have seen in the practice of a colleague, and in the literature a large number are recorded. Although we have no experimental proof, *a priori*, at any rate it seems very possible that the squeezing, which is necessary to free the kidney from its bed, might force myriads of tubercle bacilli into the circulation.
>
> In view of this possibility I have proposed the following operation: An abdominal incision is first made and the vessels are ligated and cut, care being taken to include sufficient tissue around them so that the lymphatics are also tied. The abdominal wound is then closed, the patient is turned on his back and the kidney removed in the usual way. . . .
>
> By this means the channels connecting the kidney with the body are shut off and consequently the danger of infection by squeezing material through them is entirely eliminated.

Kelly and Burnam say:

> Braasch, reporting a series of 203 nephrectomies for tuberculosis from the Mayo Clinic, records a primary death rate of only 2.9 per cent. Our own death rate has been 4 per cent in 100 cases. . . . Braasch states that cases ending fatally in his series showed at autopsy general miliary tuberculosis, and we ourselves had one such case.

Hans Wildbolz says:

> And previously I had a series of 182 similar operations without a fatality. But after that, this series of successful operations was broken by three deaths that followed one shortly after the other. In two of these instances the patient died from miliary tuberculosis six weeks after operation.

This small percentage of miliary tuberculosis following kidney operations has not caused operators to search for the real underlying cause or to take precautions to prevent it. Some operators even recommend tying the ureter and using it for traction. Such a procedure cannot be too strongly condemned, even though this author reports a large series of successful cases. The reason more cases of septicemia and miliary tuberculosis have not occurred is not that precautions have been taken to prevent them but that the pelvis is not tightly distended with infected material and traction does not increase the pressure to the point of rupture. Another possible reason why miliary tuberculosis is not more frequent is that there are very few or no tubercle bacilli present. This is borne out by the diligent search necessary to demonstrate them, even though the kidney is definitely tuberculous.

REPORT OF CASES

I shall report three cases, one of tuberculosis and two of colon bacillus septicemia, which I believe were caused by a disregard of pyelovenous backflow or because the patients were operated on before Hinman and Lee-Brown proved the phenomenon of pyelovenous backflow.

CASE 1.—*History.*—A man, aged 56, complained of pain in the left side, chills and high fever. The family history and previous personal history were irrelevant. The present illness started about six months before admission as a severe pain in the left kidney region. The pain radiated forward beneath the costal margin and downward along the course of the ureter. There was nausea and vomiting. The attack was accompanied by fever, but the patient was not sure how high. This attack lasted several days. He felt well until about three months later, when he had another attack of about the same severity as the previous one. Following this attack there was some pain or discomfort nearly all the time. About two weeks before admission to the hospital he had a third attack, accompanied by very high fever, intense pain, and nausea and vomiting. From this time on, his illness was very stormy. He had attacks of pain every day and chills at irregular intervals with very high fever. I first saw him when he entered the hospital, March 22. At this time he was very sick, having frequent chills and high fever, vomiting frequently, sweating profusely and taking very little fluid.

Examination.—The patient was very well nourished. The face was flushed and hot; the tongue was dry and coated. The head and neck were normal.

The chest was rather broad. Respiratory movements were equal on the two sides, but movements were limited even on deep inspiration. Palpation, percussion and auscultation showed nothing. There was no swelling to be made out over the back at this time.

The abdomen was rather fat. There was marked tenderness over the left kidney region on bimanual palpation. The left kidney was not palpable, nor was the right one. No masses or any other area of tenderness was made out.

Nothing abnormal was made out on the arms or legs. An examination of the buttocks was not done as the patient had not complained of anything in that region.

Rectal examination showed a moderate hypertrophy. Otherwise, rectal examination was negative. Had the buttocks been swollen, it would surely have been noticed at this time.

Examination of the urine revealed: albumin, plus; sugar, none; pus, two plus; bacteria bacilli, four plus; blood, none; casts, plus.

Cystoscopic examination showed residual urine, about 1 ounce. The prostate was slightly enlarged. The entire bladder and

prostatic orifice were inflamed. Number 7 catheters were passed up both ureters with ease. Phenolsulphonphthalein appeared on the right side in three minutes; 20 per cent was excreted in fifteen minutes. The urine was not infected nor did it contain pus. The left side showed no trace of phenolsulphonphthalein in twenty minutes. It was loaded with pus and colon bacilli.

A plain roentgenogram was negative. A pyelogram showed that very little of the solution had entered the pelvis. This was streaked and mottled to such an extent that tumor was suspected in addition to the infection.

The patient continued to have pain, chills and fever.

Operation and Result.—An operation was performed three days after he entered the hospital. The anesthetic was started with nitrous oxide and oxygen and later switched to straight ether.

The usual left kidney incision was made. The fat and muscles were very thick. The kidney was easily separated from the surrounding fat, but the pedicle was very short and it was difficult to bring the kidney up into the wound. The entire surface was dotted with small abscesses. The ureter was divided between two clamps and each end ligated. It was difficult to place clamps on the pedicle, and in attempting to do so much manipulating was necessary. At last this was accomplished and the kidney removed. In tying the pedicle, a vessel escaped and there was some hemorrhage, though by no means alarming. The patient's condition did not warrant further delay, so a pack was placed against the bleeding point. This controlled the hemorrhage. The wound was closed by the usual layer method. The patient stood the operation poorly. He was given 2,500 cc. of solution by hypodermoclysis on return to the ward. Within less than an hour the temperature rose to 105.5 F. He became cyanotic, the pulse rapid. He did not regain consciousness for about six hours, during which time the temperature remained very high. During the next few days there was marked distention of the abdomen. The usual remedies failed to give relief, but later the bowels moved satisfactorily.

During eight days following operation he was given fluids by hypodermoclysis and fed by intravenous injections of dextrose. He received from 160 to 200 Gm. a day in small but frequent doses. The urinary output during this time was good.

About four days after operation, swellings were noticed over the right elbow, the right scapula and the right buttock, extending over the sacrum. These were treated with hot compresses. As soon as fluctuation could be determined, they were opened and a thick, foul-smelling pus was obtained. A culture showed Bacillus coli. The abscesses over the elbow and scapular region healed well, considering the condition of the patient. The one over the buttock continued to drain a large amount of pus, though it had been treated frequently with surgical solution of chlorinated soda. The wound was enlarged and a large, black slough was seen. Traction revealed the surprising fact that the entire fat of the buttock was dead and came away in one piece. The wound was slow in healing, requiring two months.

All the packs placed to control the hemorrhage were removed by the end of the fifth day. There was no hemorrhage. The wound drained a large amount of dirty, serous material, and its edges were infected. On about the eighth day the stitches were removed and the wound fell apart. It was first noticed that there was fecal discharge. An enema of methylene blue (methylthionine chloride U. S. P.) came out through the wound, demonstrating that the opening was in the colon. For a long time all the feces escaped through the wound, but later this healed until only a pin point opening remained, through which gas occasionally escaped, but no feces unless the bowels were loose. The patient's general health following this extremely difficult operation and stormy convalescence is excellent.

Pathologic Examination.—The left kidney was swollen and measured 14 by 7 by 5 cm. The capsule stripped easily, leaving a bulging, smooth surface. Many individual and confluent miliary abscesses were seen through the capsule. On section similar abscesses, often seen in streaks, were demonstrable through the cortex. The pelvis was considerably dilated and filled with pus. Its mucosa was greatly thickened. The calices were dilated. A stone the size of an ordinary bean was impacted at the ureteropelvic junction. The picture was that of suppurative pyelonephritis, secondary to obstruction caused by stone.

Sections through the cortex showed many small abscesses and many conglomerate abscesses. Many tubules were packed with pus and there were areas between these abscessed patches in which relatively normal architecture was noted, but in these areas the glomerular and tubular epithelium were so greatly swollen that it was doubtful whether these structures functioned.

The pathologic diagnosis was subacute, suppurative pyelonephritis with multiple abscess formation, secondary to upper ureteral calculus.

It is evident to me that a blood stream infection occurred at the time of the operation, resulting in large, multiple abscesses. This is borne out by the very high temperature and by the toxemia following it. It is to be noted also that all the abscesses were on the right side. This may be due to the fact that the patient was lying on his right side at the time of operation and that his circulation was poor throughout the entire time.

Case 2.—*History.*—A woman, aged 44, complained of pain in the left side, chills and fever. The family history was unimportant. The patient had marked shortness of breath on slight exertion; the pulse was very rapid. She had had vertigo but had never fainted. She had frequently had indigestion. She had nausea when she had pain in the kidney but had vomited only with the last attack. The formation of gas was very troublesome.

Her present illness started seven months before admission, at which time she said her physician had found pus in the urine. Shortly after this, she had an attack of pain in the left kidney region, accompanied by chills and fever. The pain radiated to the front but not along the course of the ureter. She had had several of these attacks before the last one. About ten days before, she had marked pain in the left side. This had been more or less constant since then. Chills were frequent and the temperature was high. She had had almost constant nausea and vomiting.

Examination.—With the exception of hypertension and slight enlargement of the heart, the general physical examination showed nothing of importance.

Examination of the urine showed albumin, plus; sugar, none; casts, plus; pus, plus; infection, bacilli.

On cystoscopy the bladder showed a very mild cystitis.

Number 7 catheters were passed with ease to the kidneys. Phenolsulphonphthalein appeared from the right side in four minutes and from the left in eight minutes; in thirty minutes the right side excreted 30 per cent, the left 6 per cent. Each side contained pus and colon bacilli.

A plain roentgenogram showed stone in the region of the left kidney.

A pyelogram showed moderate hydronephrosis; also stone in the pelvis of the left kidney at the junction of the ureter.

Operation and Result.—Two days later the operation was done, the usual kidney incision being made. The kidney was easily exposed, but an attempt to free it disclosed that the inner border was adherent. The pelvis was particularly adherent to the surrounding tissues. After the kidney had been freed from the surrounding structures, it was delivered into the wound as gently as possible. The stone occupied the position of the ureteropelvic junction. When this was opened, the urine and pus within the kidney spurted out with considerable force. The stone was easily removed and the pyelotomy wound closed with continuous catgut sutures. The wound was drained with two cigaret drains and the wound closed as usual.

Immediately after the operation the patient's temperature was 103 F. The temperature remained high for six days, then stayed around 100 to 101 for another five days. A blood culture showed colon bacilli the day following operation.

The wound did not heal very rapidly. The patient was anemic. Two weeks after operation she was given 500 cc. of blood by the direct method. After this she improved rapidly. She left the hospital thirty-five days after operation. It is not

possible to say when the blood stream infection cleared up; three days after the culture was positive another was negative.

She returned to the office for treatment of the infection in each kidney. This greatly improved but never actually cleared up.

CASE 3.—*History.*—A man, aged 20, complained of pain in the right side and frequency of urination. The father and mother were dead, cause not known. Two brothers had died of tuberculosis. The patient had had no previous serious illness.

The present illness began about four months before admission as a pain in the right lumbar region. The pain radiated to the front and down into the right pelvis. Frequency and burning on urination started about the same time. He urinated about every hour. Two months before, the patient felt a severe pain in the right upper part of the abdomen, which radiated through to the back. He was confined to bed for about ten days. He then was up for two weeks and felt fairly well. He later had another attack of severe pain. This had been present ever since, confining him to bed. He had occasional chills and fever. During his illness, he fainted on several occasions.

Physical Examinations.—The patient was pale and anemic. He evidently had lost considerable weight.

The chest was of the narrow type. The right shoulder was deformed, the result of an accident. The two sides of the chest were equal in size and shape. Expansion was equal. The left side was larger at the base than the right. On palpation, vocal fremitus was slightly more marked over the right side of the chest. On percussion there was impairment of resonance at the right apex. The right side was negative, otherwise, on percussion. There was increased dulness over the lower left side of the chest. On auscultation, breath sounds, anteriorly, were normal over both apexes. There was bronchovesicular breathing over a small area of the right side. Posteriorly, the bronchovesicular breathing was heard. The voice sounds were distant at the left base in the axillary line.

The impression was that there was chronic pulmonary tuberculosis.

The abdomen was scaphoid. Respiratory movements were free and equal. There was tenderness over the right kidney region, and on deep inspiration the right kidney could be felt. It was tender and somewhat enlarged.

The urine was straw colored. There was a moderate flocculent deposit; the reaction was neutral. Examination revealed: sugar, none; albumin, none; pus cells, moderate number; blood, none. No tubercle bacilli were found.

In the first hour, 50 per cent of the phenolsulphonphthalein was excreted; in the second hour, 15 per cent.

Cystoscopy showed that the bladder was greatly inflamed and in places ulcerated, particularly around the left ureteral meatus.

On ureteral catheterization the right kidney put out only pus and degenerated material. A stain for tubercle bacilli was negative. Secondary infection of many other bacilli taking the methylene blue stain was seen. The urine from the left kidney was normal.

Pyelogram of the right kidney: The upper minor calices showed marked blunting and dilatation, as did the lower. The pelvis was small. The pelvis and calices gave a shaggy appearance. There were several small cavities in the lower portion of the kidney.

The day before operation, the patient was given 500 cc. of blood by the citrate method.

Operation and Result.—A right nephrectomy was done with nitrous oxide oxygen anesthesia. The usual incision was made. The kidney was easily exposed. The ureter was clamped and tied at two places and cut between the ligatures. The ureter was greatly thickened. The kidney was then freed with difficulty, owing to adhesions. The pedicle was very short, making delivery of the kidney impossible. It was clamped, cut and ligated by transfixation. During this manipulation the pelvis ruptured, and pus escaped in the wound. It evidently was under considerable pressure. Closure in layers was carried out with two cigaret drains at the upper end.

The patient seemed to do fairly well for about a week. The wound had apparently healed well. About three weeks after operation he began to slip very fast. The wound opened in many places. He had a tuberculous infection in both lungs. He lost ground rapidly. Several weeks before he died, all the urine came through the right kidney wound, evidently traveling up the right ureteral stump to the opening. He died about two months after operation, from generalized tuberculosis.

Even though he had pulmonary tuberculosis at the time of the operation, it was thought that the miliary tuberculosis was caused by too much intrapelvic pressure necessitated by the difficult operation.

COMMENT

In these three cases, serious complications followed kidney operations. In the first case, a stone blocked the outflow of urine at the ureteropelvic junction. In addition to this, the ureter was ligated without emptying the kidney, which contained considerable badly infected urine. Then, the difficult nephrectomy made it necessary to grasp the kidney firmly in order to deliver it. This unquestionably caused great increase in intrapelvic pressure, surely enough to cause pyelovenous backflow. Dissemination with multiple abscesses followed.

The second case was one in which the stone blocked the outflow of urine. The kidney was manipulated and then delivered into the wound before the pressure was released by removal or displacement of the stone, or by emptying of the pelvic contents.

In the third case a wide dissemination of tuberculosis followed a difficult operation on a pyonephrotic, tuberculous kidney. The ureter was tied before the kidney was emptied of pus. The manipulation was sufficient to cause pyelovenous backflow.

It would seem a wise procedure, and particularly so in tuberculous cases, to drain all the pus and urine from the kidney pelvis. This could be done by placing two ligatures around the ureter. The lower one should be tied, the upper one knotted loosely. A clamp should then be placed below the upper ligature and far enough above the lower one to permit opening of the ureter. A catheter, rubber or otherwise, should be passed up the ureter into the pelvis of the kidney and all the pus drained away. The catheter should be large enough to prevent leakage around it. After the pus is drained away, the upper ligature is tied snugly on the catheter as it is removed. The ligature is then tied as usual, the wound in the ureter sterilized or cauterized, and the nephrectomy then done as usual. Of course, the wound should be protected by placing gauze beneath the ureter. In cases of block, such as a stone at the ureteropelvic junction, the stone should be removed without increasing the intrapelvic pressure, or the urine and pus should be removed before the kidney is manipulated.

Since the explanation of these serious accidents is more easily accounted for by pyelovenous backflow than by ulcerative process, it does not seem necessary or wise to resort to the abdominal route to ligate the vessels, as suggested by Dr. Walker.

Unquestionably, many of these serious complications following pyelograms and kidney operations can be prevented and many lives saved.

In making pyelograms the pelvic pressure should never be raised very high, and pain should never be produced by the injection. A definite pressure on a safety mercury manometer would seem a poor method, as more than that amount of pressure may be necessary to force the fluid through a catheter fast enough to get complete fillings.

In operations on pyonephrotic kidneys or those blocked by stone or stricture, the pelvic contents should be removed before the kidney is grasped to deliver it. Many cases of miliary tuberculosis and septicemia will be prevented by this simple procedure.

Medical Arts Building.

UNDULANT (MALTA) FEVER SPONDYLITIS

REPORT OF A CASE, DUE TO BRUCELLA MELITENSIS, BOVINE VARIETY, SURGICALLY TREATED

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AND
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Our object in this paper is to report a case of undulant fever spondylitis that was surgically treated and to review briefly the general aspects of this disease. This is the first proved case to be reported of Brucella melitensis involvement of the human spine.

Undulant fever is a general infection caused by one of the subspecies of Brucella melitensis. The natural habitat of these organisms is in the domestic animals, in which there is a widespread distribution. For man, the principal contact sources are cattle, goats, sheep and swine. The disease is characterized, in certain animals, by slight and often unrecognizable constitutional symptoms; in the female, by a tendency to repeated abortions, followed often by a carrier state, through chronic infection of the udder with excretion of bacteria in the milk.

Undulant fever in man and infectious abortion in animals remained unrelated until Evans indicated in 1918 the close relationship existing between the organisms causing the two diseases. Bruce discovered the organism in a patient who died of Malta fever in 1886 from stained sections of the spleen. In 1897, Wright and his associates demonstrated specific agglutinins in the blood serums of Malta fever patients. Although epidemics of infectious abortion in domestic animals have existed since the dawn of history, the causative

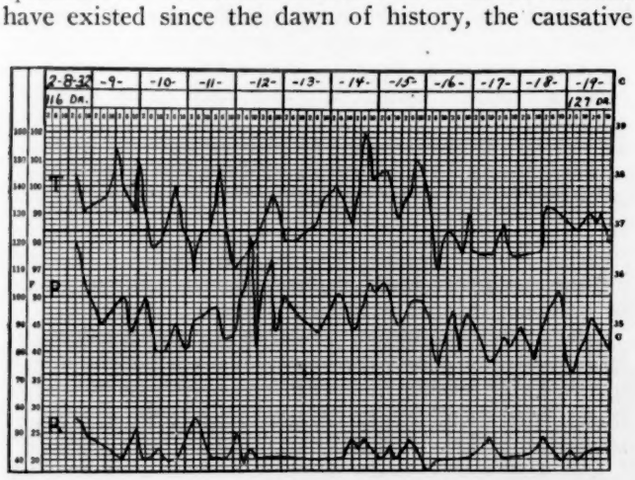

Fig. 1.—Temperature, pulse and respiratory rates, before operation (service of Dr. Fred M. Smith). This represents the time interval between Feb. 8 and Feb. 20, 1932, and begins with the one hundred and sixteenth day of the patient's illness. It is characteristic for his period of observation in the medical service.

organism was not discovered until 1895, by Bang and von Stribolt. In 1910, MacNeal and Keri isolated the specific organism from cattle in the United States. The first human case originating in the United States was reported in 1905 by Craig. In Iowa the disease is as prevalent as typhoid and paratyphoid, according to Hardy, who collected 1,430 cases in continental United States prior to 1929.

From the Department of Orthopedic Surgery, service of Dr. Arthur Steindler, State University of Iowa College of Medicine, Children's Hospital.

The following classification of this organism has been suggested by Hardy, Jordon, Borts and Hardy:

1. Brucella melitensis, variety melitensis.
2. Brucella melitensis, variety abortus (bovine).
3. Brucella melitensis, variety suis (porcine).

The most severe infections result from the melitensis variety. In Iowa it is believed that the abortus and suis varieties are equally responsible for the morbidity of undulant fever in man. Morphologically, the organism is a gram-negative short, nonmotile, slender pleomorphic rod with many coccoid forms. It does not form spores.

Fig. 2.—Appearance of the lumbosacral spine before operation: *A*, the most striking changes noted are in the interarticular facets, particularly between the fourth and fifth lumbar vertebrae on the right side (shown by arrow). The destructive lesion is evident. In the facet just above, on the same side, may be noted less definite signs of involvement. The psoas muscle shadow is distorted on the right side. *B*, one month later: The lesion is more advanced, and the intervertebral space between the fourth and fifth lumbar vertebrae is narrowed on the right side. Little or no difference is to be noted in the joint above. The psoas shadow distortion is increased. In the lateral views there were no changes seen in the bodies of the vertebra nor elsewhere in the osseous system.

An increased concentration of carbon dioxide tension of the air is necessary to yield a culture of the bovine variety. The types can be differentiated by special cultural characteristics and reactions.

Human infection results from contact with infected animals through ingestion of raw dairy products or from handling live stock as fresh meat. The incubation period varies from ten days to three weeks. The onset may be insidious or sudden, and the symptoms may occur singly or variously combined. Prominent symptoms may be headaches, chilliness, anorexia, general aching, night sweats, stiffness of the neck or joints, arthralgia, abdominal pain, drowsiness or dizziness, loss of weight, painful micturition, malaise, insomnia, cough, constipation and backache. The fever in most of the cases of suis and abortus varieties runs a rather low grade course. As a rule the fever is intermittent; the temperature gradually increases during the period of invasion and disappears by slow lysis. Cases presenting abscess formation may be expected to show a chronic continuous low grade temperature without periods of remission. The many symptoms enumerated imply an extreme irregularity of the course of the disease. The diagnosis is established by the agglutinin test, by skin tests, by blood culture; and by isolating the organisms from abscesses, from urine and sometimes from the stools.

Of special interest and particular significance is the frequency of low back pain as an early symptom. In Hardy's series of more than 300 cases, this occurred in 15 per cent. It is reasonable to assume that spinal involvement has been frequently overlooked in the past. In this connection it may be stated that the sites of

predilection in inoculated guinea-pigs are the joints, bones, testes, spleen, spine, liver and lymph glands, which exhibit a close relationship to the distribution in the human being.

The differential diagnosis involves a careful consideration of typhoid and paratyphoid, influenza, tuberculosis, malaria, pyogenic septicemia, subacute bacterial endocarditis, acute rheumatic fever, tularemia, appendicitis and cholecystitis and infections of the genitourinary tract.

Knowledge of the pathology is limited, owing to the low mortality, and depends on the stage of the disease. The lesions are produced by the direct action of the organism or its toxic products on the tissues. There is little or no specificity of tissue reaction. Experimentally in guinea-pigs the lesions may resemble the common tubercle.

REPORT OF CASE

History.—Robert D., aged 33, a white American farmer, married, was admitted to the medical service, Feb. 8, 1932, transferred to the orthopedic service, March 5, and operated on in the orthopedic department, March 15. The patient stated that he was in excellent health until August, at which time he developed low back pain, which came on insidiously. This was dull and aching in character and had no relation to his physical activities in particular. The pain did not radiate and was more or less constantly present. He continued performing his daily routine until two weeks before admission, when the pain became so severe that he was forced to seek relief by recumbency and analgesics. At this time the pain became localized in the lower right portion of the back.

About two months after the onset of the backache, the patient began to experience moderate pain throughout the entire abdomen. This had no relation to meals and was sometimes relieved by a bowel movement. For the past month daily cathartics had been necessary to relieve the persistent constipation. Nausea, occurring about once a week, accompanied the abdominal symptoms. This had never caused actual vomiting. The appetite had been poor, and there had been a loss of 40 pounds (18 Kg.). He was getting progressively

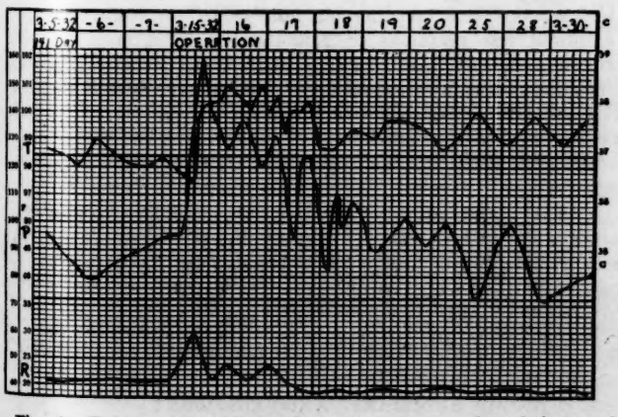

Fig. 3.—Temperature, pulse and respiratory rates just before and after operation (service of Dr. Arthur Steindler). The patient's postoperative condition was remarkably good, and the convalescence practically uneventful. The time interval was between March 5 and March 30, 1932. Since April 1, the temperature has been normal.

weaker and had a constant feeling of fatigue. The stools had been normal in color and consistency.

His first chill occurred about November 1 and was followed by a temperature of 103 F. He remained in bed for three days and was treated for "intestinal influenza." After this he did not have any more fever or chills until December 15, when it recurred and was accompanied by nocturnal sweats. Since that time he had had two or three chills a week, sometimes lasting an hour.

Since November 1, he had had nocturia, with a frequency of three or four times. There had been no frequency otherwise or urgency, pus or hematuria. Recently there had developed a slight burning on urination. The bowels had been constipated for the past month.

The past and family histories were essentially negative. The remaining functional history was essentially negative.

Examination.—The patient was well developed and well nourished, weighing 184 pounds (83.5 Kg.), 5 feet 11 inches (180 cm.) tall, with a moderately flushed face, in obvious pain, not dyspneic, and lying quietly in bed. There was some evidence of loss of weight on the arms. There was a slight tortuosity of the vessels in both fundi of the eyes. The thyroid was slightly enlarged. There was a slight impairment of excursion of the lungs in the left costal margin. The heart was essentially normal. The blood pressure was: right brachial, 135 systolic and 90 diastolic; left brachial, 130/85.

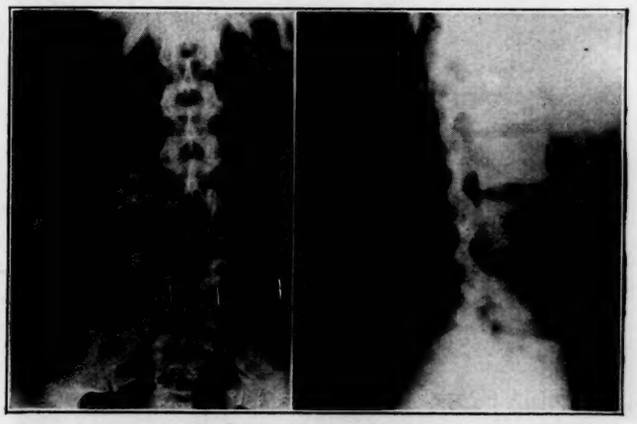

Fig. 4.—Appearance of the lumbosacral spine seven days after operation: The lower three right lumbar facets have been curetted; the right transverse process of the fourth lumbar vertebra has been entirely resected and that of the fifth partially, to establish free drainage of the abscess encountered just anterior to the transverse processes of the third, fourth and fifth lumbar vertebrae on the right. The lateral view of the spine is not remarkable.

The abdomen was normal in contour and muscular tone. The liver was barely palpable below the right costal margin; the spleen was just palpable. There was a slight tenderness over the entire abdomen, most marked over the left upper quadrant.

The prostate was slightly enlarged, and several external hemorrhoids were present.

There was moderate tenderness over the lower part of the back and the left sciatic notch.

The admission diagnosis was undulant fever or subacute bacterial endocarditis.

Feb. 11, 1932, the patient was given a solution containing 0.2 Gm. of acriflavine base intravenously, with no reaction. In the next nine days he received altogether 1.5 Gm. of the drug with no effect on the temperature or his general condition.

The epidemiologic data gathered by Dr. C. F. Jordon, February 12, showed that the patient had had contact with cows and hogs and had been exposed to raw dairy products.

Cows: It had been necessary to remove the placenta from one of the patient's nine cows in March, 1931. This was done by some one else, the patient himself having had no contact in this manner. All the milking was done by the patient. The milk was used only in the form of cream, on cereals and in coffee. (It has been definitely demonstrated that the organisms float to the top with the cream and are most highly concentrated in this layer.) He had been eating much butter, this being home churned. Four of his cows recently had had positive skin and agglutination tests.

Hogs: There was no history of infectious abortions in eight sows on this farm.

Special Types of Contact: The patient had helped put rings on twenty-eight shoats last fall. He had also trimmed a boar about the same time.

Laboratory Tests Before Operation: The Wassermann test was negative to both antigens. The Kahn test was negative. Agglutinin tests were positive for undulant fever, February 10, in a dilution of 1:160, and February 13, in a dilution of 1:320. They were negative for typhoid and paratyphoid

A and B in all dilutions. Skin tests were positive to Brucella vaccine.

Chemical examination of the blood revealed: uric acid, 6.5; urea nitrogen, 13.3; creatinine, 1.0. The white blood cells ranged between 5,400 and 9,200; red blood corpuscles, 4,850,000, hemoglobin, 90 per cent (Tallqvist), March 8. Blood culture, February 16, yielded no growth in six days. The coagulation time was four minutes.

February 8 the patient weighed 184½ pounds (83.7 Kg.); February 27, 177 pounds (80.3 Kg.).

Tests of the urine were negative on many examinations, save that on one occasion the specific gravity was rather high and a trace of sugar was found.

March 9, the patient was seen by Dr. Steindler, at the request of the medical department. At this time the patient's chief complaint was severe low back pain, which he localized in the region of the sacro-iliac joints. The pain did not radiate.

Examination revealed definite tenderness on palpation over the lower lumbar region a little to the right of the midline.

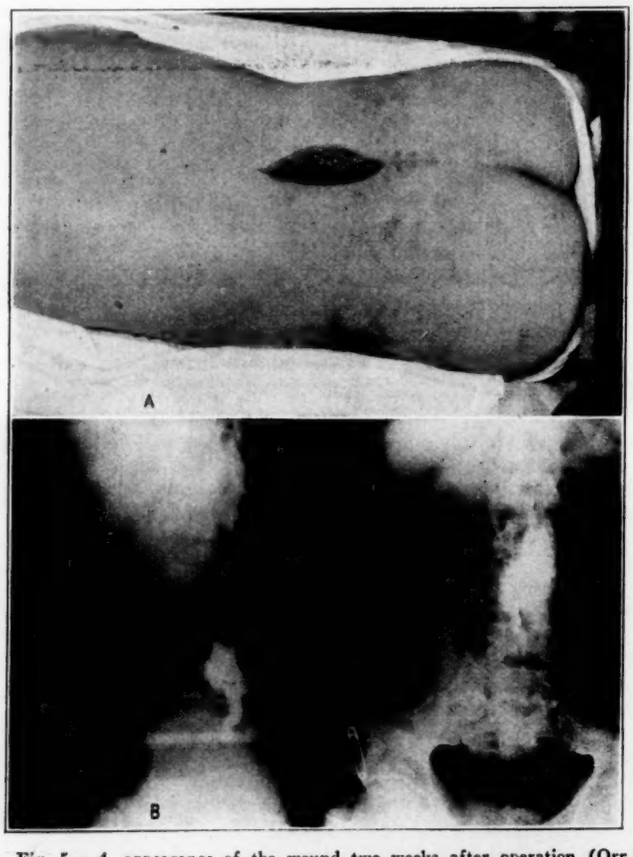

Fig. 5.—*A*, appearance of the wound two weeks after operation (Orr drainage): The petrolatum pack has been removed to permit photographic recording. Abundant red healthy granulations are filling in the entire operative wound. The Orr method will be continued until sound healing has taken place. *B*, operative field after injection of sinus and wound with iodized oil two weeks after operation. The bodies of the vertebrae and the intervertebral disks are apparently not involved.

There was spasm of the erector spinae mass over the same area. Motions of the lumbar spine were markedly limited. The sacro-iliac and hip joints were not remarkable. The liver and spleen were not palpable. There was no abdominal muscle spasm, but there was a definite localized area of increased temperature of the skin over the right lower quadrant, of which the patient himself was conscious.

Roentgen examination of the pelvis and hips did not show any pathologic changes of the bone. There were destructive changes in the interarticular facets of the lower lumbar vertebrae on the right, most pronounced between those of the fourth and the fifth. The psoas shadow was distorted on the right side; it ballooned out inferiorly, suggesting abscess formation. The lateral views of the spine were essentially normal.

The diagnosis was Malta fever spondylitis.

An exploratory operation was indicated, with biopsy and Orr drainage if pus should be encountered; if the condition was quiescent, fusion of the lumbosacral spine by the combined Hibbs and Albee methods.

Operation.—March 15, under ethylene anesthesia, the right lower lumbar and upper sacral regions of the spine were subperiosteally stripped according to the technic of Hibbs. The interarticular facets of the third, fourth and fifth lumbar vertebrae were exposed and examined from below upward. The lowest two were found to be eburnated and fused, making the diagnostic curettage difficult. The third joint was soft, hemorrhagic and easily cleaned out. A drop of pus appeared from the depths in this vicinity, and an abscess was suspected to be just anterior to the transverse processes. By further stripping of the transverse process of this region, the exploring finger encountered an abscess cavity just anterior, from which about 200 cc. of thick purulent material escaped. About 10 cc. was obtained for cultural study. By finger exploration the abscess cavity was situated approximately in front of the right lower three transverse processes. The transverse processes of the fourth and fifth lumbar vertebrae were stripped free of soft tissues and resected to facilitate adequate drainage. The lower pole of the wound over the sacrum was approximated with two dermal sutures. The entire opening was then swabbed out with iodine and alcohol, and the tract lightly packed with petrolatum gauze, which reached directly into the cavity anterior to the transverse processes, according to the Orr technic. The cavity was smoothly lined, and no direct connections could be made out with the surrounding bony structures. A generous dressing was applied, and the patient returned to the ward in a previously prepared plaster shell. His condition was good. There were no operative complications. The duration of the operation was an hour and about 1,000 cc. of physiologic solution of sodium chloride was given by hypodermoclysis during the procedure.

The patient's convalescence was uneventful save for several days of temperature rise and slight low back discomfort in the operative region. Three days after operation he exhibited an urticarial-like eruption over the chest, which lasted only a short time and caused slight discomfort. Jordon found, in examining more than 100 Iowa veterinarians, that many of them experienced a similar type of eruption after operative work on aborting animals, especially if gloves were not used. He learned that a considerable number of these gave positive agglutinin test reactions to Malta fever in dilution ranging around 1:20 and 1:40. The dressings were changed several times under aseptic precautions. The drainage is still profuse. The patient complains of little or no discomfort. The Orr method will be continued until sound healing has taken place.

Laboratory Tests After Operation: A test of the urine was negative.

A blood count, March 6, revealed: hemoglobin, 80 per cent; white blood cells, 8,400; red blood cells, 4,750,000. March 31: hemoglobin, 70 per cent; white blood cells, 8,000; red blood cells, 3,500,000. The sedimentation time that day was thirty-five minutes; April 1, it was twenty minutes.

Culture from the abscess (report of Drs. Hansmann and Borts) yielded Brucella melitensis, Bovine variety.

SUMMARY AND COMMENT

A proved case of undulant fever spondylitis was surgically treated. The organism recovered from the abscess of the spine was Brucella melitensis, bovine variety. This was obtained by special cultural methods in the laboratories of Dr. G. H. Hansmann of the Department of Pathology, State University of Iowa College of Medicine, and Dr. I. H. Borts, chief bacteriologist of the laboratories of the Iowa State Department of Health. The organism was isolated in pure culture after eight days' growth.

To an ever growing list of causative bacterial factors in infectious spondylitis is added Brucella melitensis. The differential diagnosis of spinal infections becomes more and more difficult. It is evident that laboratory corroboration is essential in establishing the diagnosis

in all osseous lesions. Although the idea of a specific organism as the cause of osteomyelitis was overthrown soon after the initiation of the bacterial era, the recognition of spinal infections, other than tuberculosis, has been fairly recent.

Pyogenic inflammatory lesions of the spine lend themselves to the principles of adequate drainage and adequate rest, as systematized by Orr, just as do the long bones. It is our opinion that adequate drainage of the spine is imperative in the treatment of pyogenic spinal disorders. The Hibbs approach offers landmarks that minimize the possible complications of the procedure.

A METHOD FOR THE PREDICTION OF SEX IN THE UNBORN

A PRELIMINARY REPORT

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AND
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In the fall of 1931, while working with male rabbits in an endeavor to utilize them for the Aschheim-Zondek method of diagnosing pregnancy, we were astonished to find that, when ten male rabbits, each 3 months old, were injected with 10 cc. of the first morning urine from women in the last two months of pregnancy, the testicles in five of them became enlarged and differed microscopically from those of the other five, when the rabbits were killed forty-eight hours after injection. In five animals, the testicles were enlarged and congested, and the vessels on the surface were engorged and dilated; when studied microscopically they showed increased cellularity and vascularity and beginning spermatogenesis, as evidenced by the formation of spermatogonia and spermatocytes, features that were not seen in the testicles of the other five animals. In no case, however, were spermatids or sperm cells present. Since the urine was from known pregnancies, the changes in the testicles could not have been due to the state of pregnancy alone; presumably it was due to some variation of the pregnancy since the animals were each 3 months old, of the same breed and of the same approximate size. Some substance that caused precocious sexual development in immature rabbits was evidently present in the urine of half of these women and was absent in the other half. It seemed likely that we had chanced on a hitherto unrecognized sex reaction. This seemed more likely when, after the labors of the women, we found that those whose urine caused the testicular development described bore female children, while the women whose urine caused no apparent changes in the testicle bore male children.

We then injected five rabbits of the same breed and size, each about 3 months old, with 10 cc. of urine from men, and five other similar rabbits with urine from nonpregnant women. When the animals were killed forty-eight hours later, it was found that in no instance did the testicles of these animals differ from uninjected controls, nor were any of the testicles mature. These results stimulated us to develop our observations.

During the next few months we studied the reactions that followed the injection of rabbits from 3 to 4 months old with from 7 to 10 cc. of urine from pregnant women. The urine was injected in the veins of the rabbit's ear; the animal was killed forty-eight hours later, and the testicles were carefully described and studied macroscopically and microscopically.

The series was advanced fairly far before we found that animals 4 months old were too mature for our work because the testicles were already developed to actual spermatid and sperm cell formation, and in twelve such cases were in the scrotum. In each of these cases we prognosticated females. Five proved so to be; the other seven were males. Since the testicular development was more advanced than that hitherto seen, we made sections from the glands of rabbits of the same age whose testicles were in the scrotum and found that the organs were already so developed that they could not be stimulated further. Consequently, we excluded all twelve cases from our tabulations. On the contrary, we found that the testicles were immature at 3 months and that those of younger animals which were still in the abdominal cavity did not react to the injection of urine. This proved that the animal must be in puberty if the testicles were such that they could be stimulated to precocious development. Yet, before we found those facts, we had injected many rabbits with urine from pregnant women. After excluding the twelve rabbits previously cited, we were able to prognosticate correctly the sex in fifty-seven of sixty-one unborn children. It so happened that our animals, with the exception of the twelve just mentioned, were all just over 3 months of age. Twenty of the sixty-one women were in the last weeks of pregnancy when the sex of the offspring was prognosticated; eleven were in the ninth month; ten in the eighth month; eight in the seventh month; six in the sixth month, and four in the fifth month.

We failed to prognosticate correctly the sex of the unborn child in four cases. In each case the child was a male, while we prognosticated a female. It may well be that the rabbits used were too mature and that the testicles had already developed to a point that we erroneously thought had resulted from stimulation of a sex hormone contained in the urine.

In spite of a considerable literature on reproduction in rabbits, we were unable to find definite statements as to when the testicles of the rabbit first function physiologically. Our work did not progress far until we learned that rabbits vary greatly in different localities, depending on the breed, climatic conditions and food. We learned that we could not always take the word of the breeders that the animal was in puberty. We were working with rabbits of a Belgian hare type which are of the type usually sold for the table. A rabbit of comparatively large size might be sexually immature, while in a smaller animal the testicles might already be functioning. After several months' study we found a definite relation between the descent of the testes and the development of spermatogenesis, which we believe is all-important to one undertaking our present problem. We found that the testis is an abdominal organ until the animal is about 3 months of age, at which time it comes down into the inguinal rings. The external inguinal rings of the rabbit lie on either side of the middle line and about 3 cm. anterior to the left of the genitals. The testes descend through the rings and finally arrive in the scrotum after a migration period of from ten days to two weeks. Spermatogenesis is not fully developed until the testicles arrive in the scrotum. Investigators utilizing rabbits for the Aschheim-Zondek

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From the Department of Obstetrics and Gynecology, University of California Medical School, and the Sugarman Laboratory.

test for pregnancy may readily mistake a female rabbit for a male when the testicles are abdominal. Our study of rabbits has convinced us that for the present purposes we must use rabbits whose testes are in this process of descent. If the testicles are not yet through the ring, the rabbit is too immature to react to the urine from pregnant women; if the testicles are already in the scrotum, they are already developed, and the animal is too mature for this test. As already stated, we found that testes that were not yet through the ring did not give the reactions to the urine of pregnancy, while those in the scrotum showed in all cases spermatogenesis advanced to actual sperm formation. Our study of rabbits was of necessity long, costly and time-consuming. Yet it taught us that controls were not absolutely necessary as long as the testicle was within the inguinal canal. If controls should prove necessary, litter mates will do, provided all the animals are of the same breed and size and have lived under identical climatic and food conditions. We have learned that a rabbitry of considerable size is necessary for this work.

This clinical test for the maturity of the rabbit, i. e., the finding of the testicles in the canal, can easily be made by digital examination and has proved of the greatest value to us in our later series. Since we were most anxious to remove any chance of error, we next ran a series, first removing one testicle to ascertain its microscopic picture, then injecting the animal with urine from a pregnant woman and forty-eight hours later removing the remaining testicle for study against the control. In order to rule out any changes due to operation such as compensatory hypertrophy of the remaining testicle, we studied the testicles of ten rabbits, removing the second forty-eight hours after the first and without injecting urine. Ether was used for the anesthetic—very little was required—the whole operation lasting less than a minute. In none of these animals were there fundamental differences in the microscopic picture of the two testicles.

We then studied ten injected animals in this manner. It so happened that the women whose urine had been injected into these animals bore nine males and one female. Consequently, we extended the series to twenty-four cases.

We found, however, that when we removed one testicle as a control and then injected the animal with urine from a pregnant woman the changes in the remaining testicle, which was removed forty-eight hours later, were not always as clear-cut and definite as those seen in the testicles of rabbits that had been injected but that had not had this semicastration. We are not prepared to discuss the reason at this time; yet the picture was sufficiently clear to enable us to prognosticate the sex of the unborn child in twenty-three of the twenty-four cases studied by this method. Ten of the women were in the last weeks of pregnancy, seven in the ninth, four in the eighth, and three in the seventh month. The testicle in nine of these rabbits showed the precocious stimulation described. We prognosticated a female child in each of these cases correctly. The remaining testicle in the other fifteen animals showed no great change from the microscopic picture of the control testicle. Consequently, in each case the unborn child of the woman was considered as a male. Fourteen were males. One was a female, the woman being seven months pregnant when we incorrectly prognosticated the sex of her child.

Combining the sixty-one cases that were studied without controls and the twenty-four cases controlled as described, we have attempted to diagnose the sex of the unborn child in eighty-five cases. With the exception of the twelve cases discussed, there are no exclusion of cases. We prognosticated correctly the sex before birth in eighty of the eighty-five cases. Five prognoses were incorrect: in four of these the fetus proved to be a male, yet was diagnosed as female because the microscopic picture of the testicle indicated its sexual maturity. One error in prognosis was a female child that had been diagnosed as a male. As already stated, it is likely that in the four cases the rabbit was too old for this work. These four errors resulted in the uncontrolled series. The one error of the female child diagnosed as a male when the woman was seven months pregnant occurred in the series that was controlled. We cannot explain this error. There were two sets of twins in the series, in each case a boy and a girl. The reaction prognosticated a boy in each case.

We are reporting our work at this time so that others may repeat it and confirm or disprove our observations. We are continuing the study, which has been made possible by the departments of obstetrics and gynecology and of pathology. As the matter now stands, we believe that we are working with true and hitherto undescribed sex hormones.

It seems reasonable to us to believe at this time that in the urine of pregnant women carrying a female child lies a hormone which can stimulate the cells in the testicular tubules of the pubescent rabbit and cause a precocious development. Since our work has been conducted on rabbits, our conclusions are from this animal alone.

The other hormone, that from the urine of women bearing male children, caused no stimulation of the cells of the testicular tubules. On the contrary, in certain sections, it appeared to have some inhibitory or depressing action. This is strongly suggested by our observations in the two cases of twins. Both of the twins were from double ova, a boy and a girl being present in each case. In spite of this fact, there was no stimulation whatsoever of the testicular cells. Possibly the hormones from the male child prevented the precocious development of the testicle which usually follows the injection of urine from women carrying a female child. This, however, is yet only pure theory. Possibly the theory, handed down by folk lore from the time of Hippocrates, that each sex carried two hormones in varying degree may be correct. The presence of male characteristics in the female is a matter of comment in many individual cases, whereas the reverse often holds in the male. This speculation may be confirmed or denied as a result of subsequent studies.

CONCLUSIONS

1. By injecting rabbits, fully 3 months old, whose testicles were in the inguinal canal, with urine from women in between five and ten months of pregnancy, we were able to prognosticate the sex of the unborn child in eighty of eighty-five cases.

2. The basis for our prognosis was the microscopic changes in the testicle of the rabbit noted forty-eight hours after injection.

3. The testes of the rabbits injected with urine from women carrying an unborn female child were developed precociously.

4. The testes of the rabbits injected with urine from women carrying an unborn male child were not so stimulated.

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DISEASE, MEDICINE AND SURGERY AMONG THE AMERICAN ABORIGINES

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The subject of disease, medicine and surgery among the American aborigines is one of a peculiar interest, not merely to the medical profession but also to wider circles. The reasons for this are both numerous and important. The American aborigines are in a large measure a race of their own. They have lived long in extensive isolation from the rest of the human family, their only connections with the Old World, aside from a possible incidental advent at long intervals of a few stray sailors, being by the very narrow and far distant Bering Strait, which marks the closest approach of Asia and America. And they had been subject for a long time to environmental and other conditions which differed both from those of their ancestors and from those of other peoples. These rare factors must naturally have tended to produce, in both pathology and medicine, more or less different conditions from those developed elsewhere, and the question is What were these differences?

This is not merely an academic question. There are probably twenty million Indians of pure and of mixed blood still living in the two Americas. The Indian blood has already become widely diffused among the white people in all parts of the continent, and the diffusion will continue until it becomes a general assimilation. The qualities and attainments of the Indian will exert, therefore, no small influence on the future American populations. For this practical reason, besides all others, it is highly desirable to learn as much as possible of just what the Indian and his close cousin, the Eskimo, represent physiologically as well as pathologically.

SOURCES OF INFORMATION

Our sources of information on the subject under consideration, while far from perfect or complete, are exceptionally numerous and favorable. They comprise:

1. The records of the early as well as later friars and missionaries, who were versed more or less in medicine and who generally had to act as medical advisers; and of other early chroniclers. The foremost in this connection are Gomara, Herrera, Bernal Diaz, Sahagun, Oviedo, Garcillaso, Urteaga, Clavigero, the Jesuit Relations, and records of the Moravian and other missionaries.

2. The notes of officials, travelers, U. S. Army surgeons, and other medical practitioners, who came into contact with the Indian. Under this head fall innumerable more or less incidental or limited notes scattered through "letters," volumes on travel, reports to various persons or departments, and accounts of other nature. Herein belong the notes of Dr. George M. Kober and his colleagues, made while they were serving as army surgeons in the westernmost states, where they came into contact with the Indians.

3. The reports and observations of the physicians assigned to the reservations. These accounts are embodied in the series of the annual reports of the Indian Commissioners, and in numerous individual papers in the medical and other literature.

4. The special observations or studies on the Indian and the Eskimo by medical and scientific men. These include special accounts, published individually, in such mediums as the Schoolcraft Archives, in scientific periodicals, and treatises such as those of Orozco y Berra, Valdizán and Maldonado, Rigoberto, Tello, Matthews, Hrdlička, Mrs. Stevenson and Father Gerste.

5. The skeletal collections and those of other material now in our possession; particularly those of the U. S. National Museum, the Museum of San Diego, the American Museum of Natural History, and the museums at Lima, Peru.

The outcome of all the foregoing is a large body of facts and indications which, while not throughout of scientific precision, gives nevertheless a fair general insight into conditions, and this insight is exceedingly interesting. It shows many similarities to and also many differences from the conditions in other races, more especially the white races. It shows marked peculiarities in physiology and pathology, in conception of disease, in the curative practices, and in the medicines. It gives light on singular immunities and especially lack of immunities to a large series of infections, and on the modification of some of the defective immunities with time, in the American aborigines. And it reveals many aspects of the mentality as well as knowledge and ability of these peoples.

PHYSIOLOGY

Researches in physiology, as far as carried out, show that the Indian in general differs from the white man, and more or less also from other races, in the chemical properties of the blood. And these differences appear to be much the same over both of the Americas where the Indian is still present, indicating on one hand the fundamental unity of the race and on the other a relative recency of the separation of the different groups. The showing of the full-blood Eskimo in this regard is not yet quite settled.

Under strictly normal conditions, the full-blood Indian has on the average a markedly slower pulse than is that of the white and most other races, and there are indications of a slightly different metabolism.

The Indian gives, in general, appreciably lower records of muscular strength than does the white man in most of his groups. And there are indications of other differences.

Physiologically, therefore, while not as far apart as some other races, the Indian is certainly not quite the same as the white man. This alone must influence his diseases with their results.

PATHOLOGY

Before America was discovered by Columbus, it was apparently one of the—if not the—most healthful continents. We may judge of this by the relative richness of the population in all the regions when discovered. There were no areas depopulated by disease, and the early white settlers witnessed, it would seem, no epidemics that were of purely American origin. The skeletal remains of unquestionably precolumbian date are, barring few exceptions, remarkably free from disease. Whole important scourges were wholly unknown. There was no rachitis; there was no tuberculosis. There was no pathologic microcephaly, no hydrocephaly. There was no plague, cholera, typhus, smallpox or measles. Cancer was rare, and even fractures were

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infrequent. There was no lepra. Notwithstanding some claims to the contrary, there is as yet not a single instance of thoroughly authenticated precolumbian syphilis. There were, apparently, no nevi. There were no troubles with the feet, such as fallen arches. And, judging from later acquired knowledge, there was a much greater scarcity than in the white population of many diseases of the skin, of most mental disorders, and of other serious conditions.

The indigenous afflictions that were relatively frequent in the Indian (and also the Eskimo) were digestive disorders in infancy and again in the older adults; pneumonia; arthritis, including arthritis deformans of the hip joint and the spine; and, in some regions such as Peru, a tendency toward osseous tumors in the external auditory meatus.

In addition to these there were a number of serious more or less localized maladies. The main one of these was a peculiar and probably nutritional disorder in infants, which led to a symmetrical osteoporosis in the roofs of the orbits and on the vault, and was not seldom fatal. Another was the infectious verruca of certain parts of the Peruvian Andes. Still another may have been the endemic facial ulceration known as "uta" in parts of the Andean region; and there were doubtless still other geographically localized indigenous disorders of germ or parasitic causations.

As to syphilis, the close chronological coincidence of the discovery of America with the flare up of the destructive disease in southern Europe has led many to the conclusion that the sailors of Columbus acquired it from the Indians and brought it to Europe. As the disease prior to the end of the fifteenth century was not known or recognized in any part of the Old World, the inference was that it was original with the American Indians, which inference seemed to be corroborated by the finding of apparently syphilitic bones in old burials. These conclusions, nevertheless, have never been definitely proved, so that the matter is still a problem on which all further light is highly desirable. The vast amount of skeletal material that is now in our collections, or that passed within the last four decades through the hands of qualified observers, permits the following guarded statements:

Syphilis in such form as it now exists among the white races and in the Indian or Eskimo infected by the white man or the Negro did not, in all probability, exist in precolumbian America. If the disease was here, it was either sharply localized, which would be impossible to explain, or it existed in a much milder and more benign form, which in particular did not cause the characteristic lesions on the skull. But there is no indication that even such a mild form existed, for nothing has ever been found medically that would show its presence, and great numbers of Spanish and other white persons have mixed with the Indians from the earliest times, in all localities, without any untoward consequences.

To accept it as a fact that the disease existed in one or a few localities, whence the sailors of Columbus brought it to Europe, would be an unwarranted conjecture. No such locality was reported by the early Spaniards or other white explorers; none was found later; nothing in Indian traditions spoke of such an existence; and the old skeletal remains from the Antilles have never shown a trace of the condition.

There are two other weighty facts in this connection. One is the general lack of immunity to the disease when brought to the Indian or the Eskimo by the European; and the second is their helplessness when thus infected. They had special methods of treatment for all the complaints they knew, but none for the syphilitic infection.

Claims as to the American origin of syphilis have been numerous and some are still being advanced from time to time, but none of them have amounted to a definite demonstration. Laying all these claims on one side of the scale and the opposing facts and considerations on the other, the greater weight is unquestionably on the side of the latter.

About a large series of other important diseases, such as yellow fever, malaria, typhoid, scarlatina and diphtheria, there is still doubt as to whether they existed in precolumbian America. Some of them, such as typhoid, scarlet fever and diphtheria, have never assumed great importance to the Indian. About yellow fever and malaria there is still much to be learned. It is impossible to say as yet whether or not they both, or either one, were precolumbian on this continent. They may have been introduced from Africa. African Negroes began to come to South America and other parts from 1494, the date of the second voyage of Columbus. Within fifty years after the discovery they were brought to the Antilles, Mexico, Central America and South America in many thousands. They were coming from or through the most unhealthful coasts of Africa and they must surely have brought with them their diseases. Thus in the 425 years since the Negro influx commenced, a large number of African pathogenic germs must have been introduced and had ample time to spread and establish themselves.

For 440 years now, also, the white man has been bringing in his infections among which certainly malaria, which since the Grecian times was common along the Mediterranean. He brought in, too, other scourges which had hitherto been unknown in America, to which the Indian lacked any immunity, and which went through the native population like a wild fire, leaving in many parts depopulation or desolation. These scourges were essentially typhus, smallpox and measles. The two latter assumed repeatedly the status of plagues; they are very dangerous to the native to this day, and they, with typhus, yellow fever, even the bubonic plague, and eventually influenza, carried off in the course of time such numbers of the natives, Indian and Eskimo, that whole large islands and regions of the mainland were entirely or almost depopulated.

Nor was this all. Syphilis and other venereal troubles brought from Europe were destructive. But then came insidiously what finally proved the chief modern scourge to the North American Indian and Eskimo, tuberculosis. Eventually in some cases practically whole tribes became infected with this disease and large numbers perished.

Thus, it was not America that affected pathologically the rest of the world but it was Europe, Africa and indirectly Asia, that sent death in many forms to America. From this point of view the discovery of the continent by Columbus was the direst misfortune that ever happened to a race of people. That the whole race did not perish was due to their large fecundity, great distribution, relative isolation of many of the tribes in forests or mountains, the wholesome life of a great many in the open, their fleeing away when an epidemic began to develop in their midst, and eventually to the gradual building up of at least partial immunities in their body. This partial immunization became especially marked in tuberculosis and could actually be

witnessed by those of us who have since long been in contact with the Indian and the Eskimo.

CONCEPTION AND TREATMENT OF DISEASE

The conception and treatment of disease were basically similar throughout the two Americas and were about on a par with those of other human groups in similar stages of culture, including the majority of white people in the pre-Christian era. They were largely supernatural, partly natural or empirical. Wounds and disorders the cause of which was plain were regarded quite rationally and treated in the same manner. In every tribe the older women and men knew scores of herbs and various mechanical or other means, which they employed exactly as did many of our country grandmothers and grandfathers, simply, rationally, and often with marked success. They knew poisons, emetics, cathartics, antifebriles, tonics, narcotics, hemostatics, cleansing solutions, healing gums and powders. They had antidotes. They employed massage, pressure, scarification, cauterization, bandaging, splints, sucking, enemas, cutting, scraping, suturing.

But whenever the cause of a complaint was obscure, or when the complaint was proving dangerous and all ordinary aid had failed, particularly if this was in a hitherto healthy adult—then their minds turned to the supernatural. The disease was then conceived as either an affliction caused by an offended or malevolent spirit or deity, as the revengeful act of a secret enemy, or as the magic of a sorcerer. The pains and other manifestations of the disease that were not understood were then believed to be due to some noxious material or magic object that had secretly been "shot" into the patient, and the cure could be effected only by the extraction of this object, the propitation or driving away of the responsible spirit, appeal to the totem of the patient or his group, or the neutralization and confusion of the guilty sorcerer through a stronger "medicine."

MEDICINE MEN

The propitiation of deities or spirits, the overcoming of the noxious "medicine," and the finding and extraction of the material cause of the pain or other symptoms could be realized only by the "shámans," more or less supernaturally endowed individuals, mostly men but also occasionally women, who became known to the white people as the "medicine men" or "medicine women" of the tribes. There would be several such in each larger tribe. They had their specialties, and they had differing reputations. They became medicine men or women through special endowments in that line, topped by special visions or dreams in which they had been given powerful "songs" of appeal and some special fetish or fetishes, which they supplemented in the course of time by what they could learn or even buy from medicine men of renown, and by other matters, and on the basis of all of which they developed elaborate and at times very strenuous procedures.

Some, perhaps most, of these men and women became thoroughly imbued with their function and power. They grew into venerable priest-healers, who exerted a great and generally beneficial influence in the tribe, aside from healing. They tended to become also the preservers and transmitters of the tribe's sacred traditions.

But many of the medicine men were of lesser caliber. They ranged from the well meaning but not highly competent to mere and not seldom mischievous impostors.

The Indian medicine man, with his assistants, was generally well rewarded. A sheep, a blanket, a horse, or more were his common remunerations. But his "cases" were scarce; and woe to him if, in the absence of an epidemic, he lost three or four adults in the course of a few months or so. Such an occurrence was taken for a sure sign that he had lost his good powers and had turned a sorcerer, which meant death inevitable.

The male medicine men served mostly men, but also more or less the women and children; the medicine women aided mostly women and children, but on special occasions, or in some tribes, also the men. Some of the medicine men practiced also limited surgery, while the medicine women inclined to obstetrics and gynecology. Famous medicine men received special honored burial; the remains of others, particularly of those who were believed to have turned "sorcerers," were regarded with suspicion or even feared much.

SURGERY

There was no systematic surgery in precolumbian America, with the exception, perhaps, of the operations of trepanation in Bolivia and Peru. Nevertheless, medicine men and special healers among the Indians were more or less adept at healing wounds, at minor and rarely even serious operations, at bone setting and at reduction of dislocations. But surgical etiology as well as treatment, though in the main remarkably rational, were mixed everywhere with magic and the supernatural.

Both the Indian and the Eskimo had a good practical knowledge of human anatomy in both sexes. They knew certain narcotics, such as coca, the daturas and tobacco. They employed "antiseptic" agents, such as a decoction of the willow with which wounds were cleaned, though this conception of the action or rather virtue of such means was mixed up with the magical. They stopped blood flow by cauterization or by the scrapings from a tanned skin. They used "lancets" of stone or obsidian, cut out affected flesh which was "on way towards turning into worms," and would scrape an affected bone. They used suturing and other methods of closing a wound. And on rare occasions the native surgeon undertook even a serious operation. An abscess would be opened, the removal of an arrow helped with a knife. In Peru, wooden stumps were found which had served as artificial substitutes for lost parts of lower limbs, but there is no knowledge as to whether the parts were lost accidentally or by amputation. Finger joints were cut off by women in mourning; castration of the guilty male was practiced in some of the tribes as a punishment for adultery; in other tribes a part of the nose of the guilty female was cut off; the lips or ears were slit for decorative purposes; but such acts were not surgery. In parts of America there developed a highly successful line of true surgery, which was that of the head and the skull. It would seem that this practice may have been brought by the forefathers of the Indians from the Old World. However this may be, it had a wide prehistoric American distribution, reaching loosely from British Columbia to far down in South America. It found its greatest development in the highlands of Peru and Bolivia. It was directed not only to the treatment of wounds in the head, but also to other pathologic conditions in the head. It reached its acme in the art of trepanation. In the central Andes there had been, evidently, much fighting among the numerous native groups. The principal weapons were slings, clubs and star-shaped stone or

copper maces. In addition, as a result of the very rugged and rocky nature of the country, there must have been many head injuries. Many of the wounds that were not immediately fatal were attended with fractured and impressed bone in the vault of the skull. And the medicine men discovered that, by removing the broken pieces and cutting off the jagged bone about the wound, the patient might recover.

Simple trepanation was known to individual medicine men since remote time. It was originally practiced, it would seem, on rare occasions, for brain disease. In Peru and Bolivia it was extended to the treatment of injuries until it became a common operation. North of these regions the trephined skulls show generally no preceding wounds; in Peru and Bolivia a large majority of the trephined skulls show definite signs of preceding injury. In the Andes the practice reached its greatest development and, judging from the results, was astonishingly successful.

The U. S. National Museum has more than 100 skulls from Peru showing trepanation or related forms of surgical procedure; and other important collections of this nature exist in the American Museum, New York, at Harvard, and in Lima, Peru. A large percentage of the skulls show more or less clearly the original wound for which the operation had been performed, and the rational nature of the procedure of the operators. When no wound is visible it is probable that the cause was of medical nature, such as persistent pains. When no cause is visible and there was no healing, the specimen represents quite likely a practice-operation on the dead, such as may frequently be encountered in our dissecting room material.

The trepanation was single or multiple. Two or three healed trephinings in a single skull are not infrequent, and as many as five have been found in one specimen. These represent in all probability repeated operations, made from time to time for some intractable condition.

The old native surgeons were very bold. No part of the vault of the head was immune to them, and some of the openings they made were so large that they necessitated artificial stoppers to prevent brain hernia. For such stoppers they used gourd, shell, and in a few known instances beaten silver. They must have used some anesthetics or, more likely, narcotics; and there must have been some antiseptic lotions and powders, for signs of infection are very infrequent.

The mode of operation differed. The instruments were of stone, obsidian, and perhaps copper. The methods were cutting, sawing, scraping, drilling, and combinations of two or more of these procedures. Some of the operations took off only the outer and middle layers of the bone, without penetrating into the skull. An extensive scraping, down to the inner compact layer and perhaps even through this in spots, would cover several square inches of the forehead or of the top of the cranium. When the opening was through, the edges of the bone were smoothed or beveled. When a larger portion of bone was to be taken out, crisscross cuts were made over it and one small piece was pried out after another.

The results were remarkably good. In many of the specimens there are indications, by the new formed bones, that the individual survived many years, and the skulls with multiple operations show no failure. The whole procedure of native trephining in the central Andes region became, plainly, a highly differentiated, very successful, and quite common surgical procedure. And a knowledge of this procedure, it has been shown by Bandelier, has persisted among some of the medicine men of the territory to the latter part of the last century —may, in fact, exist there at the present.

OBSTETRICS

Assistance in childbirth was generally given by older women relatives, by women reputed to be especially effective in such cases, and occasionally, when there was need, even by the husband, or by a regular medicine woman or man. The aid by the men was mostly of mechanical nature, an application through one means or another of a pressure to the abdomen, when the birth was delayed; to which the medicine woman or man added various means, medicinal, fetishistic or otherwise magical, as seemed to be required. The native burials of all times show an abnormal proportion of young females, indicating that many died, in all probability, from the accidents of childbirth.

MEDICINES

"Medicine" may be defined as an agent or influence employed to prevent, alleviate or cure some pathologic condition or its symptoms.

The scope of such agents among the Indians was extensive, ranging, as among other primitive peoples, from magic, prayer, exhortation, force of suggestion, and a multitude of symbolic and empirical means, to actual and more or less rationally used remedies.

In general the tribes showed many similarities in regard to medicine, but the actual agents employed differed with localities, as well as with individual healers.

The employment of magic consisted in opposing a supposed malign influence, such as that of a sorcerer, spirits of the dead, or mythical animals, by the supernatural power of the healer's fetishes and other means. Prayers were addressed to benevolent deities and spirits, invoking their aid. Healing songs, consisting of prayers or exhortations, were sung. Harangues were directed to evil spirits and were often accentuated by noises and threats, to frighten such spirits away. Suggestion was exercised in many ways, directly and indirectly. Curative ceremonies usually combined all or most of the agencies mentioned. Some of the healing ceremonies, such as those described by Matthews among the Navaho, were very elaborate, prolonged and costly. The fetishes used were peculiarly shaped stones or wooden objects, lightning-riven wood, feathers, claws, hair, figurines of mythical animals, representations of the sun and of lightning, and were supposed to embody a magic power capable of preventing disease or of counteracting its effects.

THE SWEAT BATH

Among the more rational hygienic and medical practices of all the American aborigines, the chief was that of the sweat bath. The sweat bath constituted the essential part of all preparation for great events, including important ceremonies. It was the thorough external cleansing, while purgatives and emetics, with the addition perhaps of more or less fasting, secured internal purification. But the sweat bath was resorted to also when a man was tired, as after a hunt or a battle, or when he "felt bad" in head or body; and with certain modifications it was the chief remedy in the more serious cases of arthritis or rheumatism.

The sweat bath was generally taken individually, but occasionally in a small party. It was exclusively a male practice and remedy—if women used anything

similar it was in their privacy. It was taken in a specially constructed small dome-shaped sweat-lodge, consisting of a light wickerwork frame covered with blankets, skins or other fabric. In the center was a fireplace surrounded by small bowlders on which, when heated, the bather poured water, thus generating quantities of warm steam, which induced profuse sweating. This in turn was assisted by scrapers or different ways of rubbing the skin and was terminated by a jump in a closeby body of water, or into soft snow in winter. Among the Eskimo the "kashim" or communal men's house was used for this purpose in winter and here the bath was generally collective.

This important hygienic and remedial habit had been brought, according to all indications, from northern Asia, from which it also extended westward, the "Russian" and "Turkish" baths being merely its adaptations.

MECHANICAL MEANS: MEDICINES

Mechanical means of curing consisted of rubbing, kneading, pressure with hands or feet or with a sash or cord (as in labor or in painful conditions of the chest), the use of moxa, scarifying, flaying with nettles, cupping (by sucking), poulticing, clysmata, sweating, sucking of snake poison or of abscesses, and primitive tooth pulling. Dieting and total abstinence from food were important adjuncts of treatment in fevers and other disorders.

Vegetal medicines were numerous. Some of these were employed by reason of a real or fancied resemblance to the part affected, or as fetishes, because of a supposed mythical antagonism to the cause of the sickness. Thus, a plant with a wormlike stem might be given as a vermifuge; one that had many hairlike filaments was used among the Hopi to cure threatened loss of hair. Among the Apache, the Pueblos and others, the sacred tule pollen known as *ha-dn-tin* was given or applied because of its supposed supernatural effects. Other plants were employed as remedies simply for traditional reasons, without any formulated opinion as to their modes of action. All the tribes were familiar with and employed cathartics and emetics; in some cases also diaphoretics, diuretics and cough medicines. Every tribe also had knowledge of some of the poisonous plants in its neighborhood and their antidotes.

The parts of plants used as medicines were most often roots, occasionally twigs, leaves or bark, rarely flowers or seeds. They were used either fresh or dry and most commonly in the form of a decoction. Of this a considerable quantity, as much as a cupful, was administered at a time, usually in the morning. Only exceptionally was the dose repeated. Generally only a single plant was used, but among some Indians as many as four plants or articles were combined in a single medicine. The proprietary medicines were sold at a steep price.

Animal and mineral substances were also occasionally used as remedies. Among Southwestern tribes the bite of a snake was treated by sucking, bandaging tightly above the wound, and applying to the wound when possible a portion of the ventral surface of the fresh body of the killed snake. The Papago used crickets as medicine; the Tarahumare, lizards; the Apache, spiders' eggs. Among the Navaho and others, red ocher combined with fat was used externally to prevent sunburn. The red, barren clay from beneath a campfire was used by White Mountain Apache women to induce sterility. The Hopi blew charcoal, ashes or other products of fire on an inflamed surface to counteract the supposed fire which caused the ailment. And there were many other such practices—in most if not all instances partly magic, partly rational.

The true manner of therapeutic action is as absolutely unknown to the Indian as it is to the ignorant white man. The very term for medicine signifies generally "mystery" or "magic." It comprises prized fetishes both curative and those that are supposed to be imbued with mysterious protective power over an individual or even over a tribe. Such objects formed the principal contents of the "medicine bags" of the shamans and of other "sacred bundles."

In many localities there was prepared on special occasions a tribal "medicine." The Iroquois used such a remedy for healing wounds, and the Hopi still prepare one on the occasion of their snake dance. Among the tribes who prepared *tiswin*, or *tesvino*, particularly the Apache, parts of a number of bitter, aromatic and even poisonous plants, especially a species of datura, were added to the liquid to make it "stronger"; these, too, were termed medicines.

Just what real therapeutic virtue many of the plants used by the Indians for medicine possessed is uncertain. That some were valuable is attested by the large number of them that found their way into the white man's pharmacopeia. These include cinchona (with quinine), cascara sagrada, coca (with cocaine), hydrastis, jalapa, ipecac, sanguinaria, and many others.

THE SHAMAN'S PROCEDURE

The practices of the medicine men and women were generally held secret, particularly before the white man, in whom the native healers saw on one hand a dangerous competitor and on the other an enemy; nevertheless, a collectively sufficient number of the actual "curings" have been witnessed to give a good idea of the procedures.

The performance differed widely, in accordance with the import of the case, the social standing of the subject, or his possessions. In the simplest cases the medicine man or woman would shrewdly acquaint himself or herself with the history of the case, then give advice and leave usually some little fetish. In other cases he or she would, in addition, examine and perhaps sing the healing "song" appropriate for the occasion. In still others there would be an inquiry into the symptoms, dreams, and transgressions of tabus, followed by an examination, and the opinion as to the nature (mostly mythical) of the ailment; this was followed by a prayer, exhortation or singing, the last often to the accompaniment of a rattle. The healer would make passes with his hand, sometimes moistened with saliva, over the part affected, and finally place his mouth over the most painful spot and suck hard to extract the direct "cause" of the illness, producing the offending object in the form of a thorn, pebble, hair, or even some small living thing, which was then thrown away or destroyed. Finally there was administered a mysterious powder or other tangible "medicine," and there was left a protective fetish. In most important cases the healer prepared by personal cleansing, internally and externally, and fasting. He would paint himself elaborately and wear perhaps a special impressive mask. He would have one or more assistants. The patient and his surroundings had to be prepared. And then followed a great healing or "life-giving" ceremony or series of practices, which might continue with intervals for rest up to three, four, even nine days in succession, and which abounded in strenuous dances,

songs, prayers, exhortations and other forced manifestations, designed to counteract or banish the evil influence that was causing the disease and thus cure the patient. These ceremonies constituted the most powerful influence on the imagination and the feelings of the patient. It was the utmost of suggestive treatment of which the particular healer was capable. And the healer as a rule did not spare himself, nor was he often less imbued with the reality and power of all involved than was the patient.

ASSOCIATIONS OF CURES

Among the populous native groups, the shamans proper were associated in guilds or societies. And in some tribes there existed medicine societies, composed principally of patients cured of serious ailments. This was particularly the case among the Pueblos. At Zuñi there still are several such societies, whose members include the greater part of the tribe and whose organization and functions are complex. Their ordinary members are not healers but are believed to be more competent than others to assist in the particular line of diseases which they passed through or which is the specialty of their society and therefore may be called by the medicine men for assistance in such cases. Thus the Indian was advancing from the individual to the organized and more systematic. He followed, unwittingly, along much the same paths the white man passed over in his advance and would doubtless, if given time, have reached the same goals.

Smithsonian Institution.

ATELECTASIS IN PULMONARY TUBERCULOSIS

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The relation of bronchial obstruction to atelectasis has been known since 1844, when Legendre and Bailly [1] found that in infants long enfeebled the lungs after death usually contain many consolidated airless lobules. This, they maintained, may occur in the absence of any inflammatory pulmonary process, and develops as a result of bronchial catarrh.

Experimental proof of these views was not long in coming, for Mendelsohn [2] in 1845 and Traube [3] one year later produced atelectasis by plugging the bronchi with shot, paper and acacia. Lichtheim [4] gave the most conclusive proof of the dominant rôle played by bronchial obstruction in this condition when in 1879 he produced atelectasis by plugging the bronchi with laminaria sticks.

However, it was Coryllos and Birnbaum [5] who in a series of epoch-making publications brought forth incontrovertible proof that the determining cause of atelectasis in any pulmonary area is the complete obstruction of its draining bronchus. Moreover, they presented reliable data showing that the bronchoconstrictor reflex, diaphragmatic paralysis and the vasomotor reflex have no etiologic relation to atelectasis.

CONTRIBUTORY FACTORS

While plugging of its draining bronchus is the determining cause of atelectasis in any pulmonary area, there are many contributory factors, the most important of which are those which predispose to an accumulation of viscid secretion in the bronchial tree: inflammatory processes in the smaller or larger bronchi; interference with the function of the ciliated epithelium; pain either in the chest or in the abdomen restricting the respiratory effort, and the administration of narcotics to relieve pain which abolish the cough reflex.

When these factors are considered it is surprising to note how little has been said of the rôle of atelectasis in pulmonary tuberculosis. This is the most prevalent pulmonary disease, the pathologic evolution of which engenders the local bronchial condition required for atelectasis and the approved treatment of which makes for shallow breathing and poor bronchial drainage, and yet it was not until 1920 that Sewall [6] and later Gammons [7] called attention to the possible coexistence of the two conditions.

The case reports dealing with massive or multilobar atelectasis in pulmonary tuberculosis that have appeared recently are interesting and instructive, particularly because of the realization that massive atelectasis in tuberculosis can be successfully treated with artificial pneumothorax. However, what seems to be of greater importance is the consideration of the relation of lobular atelectasis to fibrosis and healing in pulmonary tuberculosis. It will, therefore, be the purpose in this presentation to deal at length with this phase of the subject.

ACUTE ATELECTASIS IN HEMOPTYSIS

Multilobar or massive atelectasis of the lung in phthisis is uncommon. The acute form is best seen in patients with hemoptysis in whom a large blood clot may occlude a bronchus. The atelectatic process is helped by the usual therapy for hemoptysis, namely, hypodermic administration of morphine, which interferes with the cough reflex, and absolute rest in bed in the recumbent position, which limits the function of the muscles of respiration, both of which interfere with pulmonary drainage.

The atelectatic lung may not be the source of the bleeding, for the blood can easily cross the tracheal bifurcation and occlude the contralateral bronchus.

Thus V. K., aged 27, admitted to the Harlem Hospital because of moderate hemoptysis apparently arising from the left lung, showed massive atelectasis on the right side. The atelectasis slowly cleared when narcotics were withheld to encourage coughing and bronchial drainage, and when the patient was placed in a semisitting posture to permit the normal function of the respiratory muscles (fig. 1).

CHRONIC MASSIVE ATELECTASIS

The chronic type of massive atelectasis in tuberculosis is worthy of serious consideration. I shall not consider the atelectasis due to pressure of tuberculous lymph nodes on the bronchi. This has been thoroughly discussed by Lerche,[8] Simon and Redeker [9] and others.

From the Medical Service of the Harlem Hospital.

Read before the Section on Radiology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

1. Legendre and Bailly: Arch. gén. de méd. **1**: 55, 184 and 286, 1844.
2. Mendelsohn, A.: Der Mechanismus der Respiration und Cirkulation, Berlin, B. Behrs, 1845.
3. Traube, L.: Beitr. z. exper. Path. u. Physiol. **1**: 65, 1846.
4. Lichtheim, L.: Versuche über Lungen Atelektase, Arch. f. exper. Path. u. Pharmakol. **10**: 54, 1875-1879.
5. Coryllos, P. N., and Birnbaum, G. L.: Obstructive Massive Atelectasis of the Lung, Arch. Surg. **16**: 50 (Jan.) 1928.
6. Sewall, H.: Pulmonary Atelectasis as a Source of Confusion in Physical Examination of the Chest, Am. Rev. Tuberc. **4**: 811, 1921.
7. Gammons, H. F.: Non-Pneumatic Lung Collapse, Boston M. & S. J. **194**: 538 (March 25) 1926.
8. Lerche: Infected Mediastinal Lymph Nodes as a Source of Mediastinitis, Arch. Surg. **14**: 285 (Jan.) 1927.
9. Simon, G., and Redeker, F.: Praktisches Lehrbuch der Kindertuberculose, Leipzig, Curt Kabitsch, 1927, p. 157.

Of great interest is the form of chronic massive atelectasis associated with tuberculosis in young persons who present a chronic course unattended by the usual periods of activity of the process, who are often above normal in weight, whose sputum shows fewer and fewer tubercle bacilli and whose lesion remains unilateral.

These patients rarely have tuberculous complications and would enjoy good health if it were not for secondary bronchiectasis that develops as a result of the interstitial fibrosis and cirrhosis of the lung.

Reliable data are not available to show whether this providential atelectasis and the subsequent cirrhosis are due to an old primary plugging of the main bronchus or to multiple lobular atelectasis which has slowly progressed so as ultimately to involve the larger and main bronchi.

Massive atelectasis of the lung in phthisis is most often confounded with extensive unilateral fibrosis. This is probably the reason for the paucity of the literature on the subject of atelectasis in tuberculosis. Fewer errors will be made if it is remembered that extensive tuberculous fibrosis of the lung is rarely unilateral, unless it follows an old pleural effusion or obliteration of the pleural space secondary to a long-continued pneumothorax which was complicated by an exudate, or indeed an old empyema. In the absence of such a history the diagnosis of extensive unilateral fibrosis is not justifiable and the patient may lose the best opportunity to profit by an induced pneumothorax because of the operator's fear of striking pleural adhesions.

The roentgenologist is in no position and should not be asked to make the diagnosis of the underlying pulmonary process in cases of this type. It is the clinical history and the finding of tubercle bacilli in the sputum which will settle the diagnostic problem (fig. 2).

R. N., aged 29, became ill three years prior to this report. She has never had a pleural effusion. She had fever at the onset for a few days and has complained

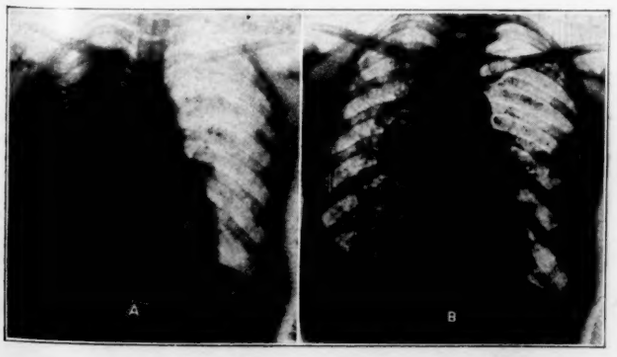

Fig. 1 (V. K.).—*A*, roentgenogram showing an acute massive collapse of the right lung following hemoptysis. Note deviation of the trachea and mediastinal contents to the right. *B*, roentgenogram taken twenty days later showing clearing of atelectasis on the right side.

of slight cough and expectoration, but there have been no constitutional symptoms for two and one-half years. Her sputum is often positive for tubercle bacilli (fig. 3).

LOBULAR ATELECTASIS

The lobular or confluent lobular type of atelectasis in tuberculosis is the most prevalent, but the least appreciated. The gross appearance of the roentgenogram of the chest in such cases may not be very striking and physical examination may not clearly point to the existence of atelectasis, but careful study will not fail to disclose its great frequency in all stages of phthisis pulmonalis.

While atelectasis may occur in any part of the pulmonary field, the most favorable areas for its development are in the lower aspect of the upper lobes anteriorly, particularly on the right side. It is also encountered in the extreme portion of the base of the left lung in the retrocardiac area. In the latter position it is often mistaken for a nonspecific infection of the lower lobe, and in the former, for an exudate at the upper right interlobular area, or indeed a pneumonic consolidation of tuberculous origin.

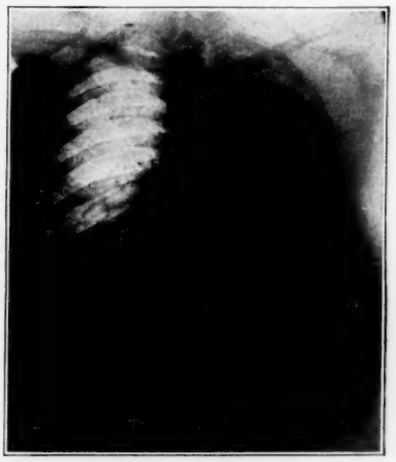

Fig. 2 (R. N.).—Roentgenogram showing chronic massive atelectasis on the left side. The patient's sputum has frequently been positive for tubercle bacilli, but there has been no other evidence of active disease in two and one-half years.

However, the clinical course in either case antagonizes the orthodox conception of the pathologic process. In the case of the supposed benign nontuberculous infection, the clinical course is active, as seen in most basal tuberculous lesions. On the other hand, in the supposed tuberculous pneumonia of the upper lobe of the right lung, the clinical course is comparatively benign, and, what is more striking, an induced pneumothorax shows no evidence of an interlobar exudate or of interlobar adhesions, and the density seen before inflation may vanish with great rapidity (fig. 4).

A careful study of the roentgenograms of the chest of patients with limited lesions shows that the changes hitherto ascribed to fibrosis occur with much greater frequency than could be reasonably expected in view of the short clinical history. The changes referred to are: (1) deviation of the trachea and mediastinal organs toward the involved side; (2) narrowing of the interspaces at the site of the lesion, and (3) elevation of the homolateral leaf of the diaphragm.

Pratt and Bushnell [10] spoke of these changes as early signs of pulmonary disease, and Norris and Landis [11] found a decrease in the size of the hemithorax in unilateral incipient tuberculous lesions. Moreover, Korol's [12] experience coincides with mine in that there is a pendular movement of the mediastinal contents on inspiration toward the involved side in unilateral tuberculosis, even in the absence of pneumothorax. More recently Kornblum and Ellison [13] described a displacement of the hilar shadows toward the side of the lesion in cases with limited tuberculous atelectatic cirrhosis.

From clinical and pathologic observations it is known that fibrosis is a process of deplorably slow evolution in

10. Pratt, J. H., and Bushnell, G. E.: Physical Diagnosis of Diseases of the Chest, Philadelphia, W. B. Saunders Company, 1925, p. 128.
11. Norris, G. W., and Landis, H. R. M.: Diseases of the Chest and the Principles of Physical Diagnosis, Philadelphia, W. B. Saunders Company, ed. 3, 1924, p. 380.
12. Korol, E.: Atelectasis in Pulmonary Tuberculosis, Am. Rev. Tuberc. **23**: 493 (May) 1931.
13. Kornblum, K., and Ellison, R. T.: Tuberculous Atelectatic Cirrhosis of the Lung, Am. J. Roentgenol. **25**: 620 (May) 1931.

phthisis. How is it, then, that it is encountered so often in early infiltrates? The only answer is to be found in the recent realization that changes hitherto ascribed to fibrosis are often due to lobular or confluent lobular atelectasis. The great frequency of lobular atelectasis would suggest that it is not of merely accidental occurrence in tuberculosis, but that it plays an important rôle in the fibrosis and healing of the tuberculous pulmonary process.

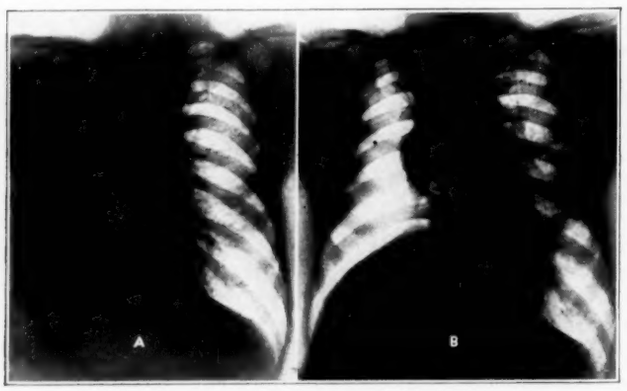

Fig. 3 (C. R.).—*A*, roentgenogram showing chronic massive atelectasis of the right lung. Note complete acquired dextrocardia and tracheal deviation to the right. *B*, roentgenogram showing almost complete therapeutic pneumothorax, with the heart and trachea in normal condition and no evidence of extensive pleural changes. The right portion of the diaphragm is elevated because of a right phrenicectomy.

It has been shown by Bruns [14] and Coryllos and Birnbaum [15] that in the atelectatic lung the circulation is progressively impaired, and that circulation in and ventilation of the lung are parallel functions. When ventilation is impaired, as in atelectasis, the circulation is decreased.

There is also ample evidence to show that, whether resulting from compression, as in pneumothorax or thoracoplasty, or from plugging of the bronchi, atelectasis is conducive to fibrosis [16] and healing of tuberculous foci of the lung.

It is, therefore, reasonable to infer that this process is one of nature's ways to limit toxic absorption from the area involved and at the same time promote the cicatrization and healing of the disease process.

ATELECTASIS IN INDUCED PNEUMOTHORAX

Lobar or multilobar atelectasis is not infrequently encountered in the course of induced pneumothorax. In this paper I shall not refer to compression atelectasis, which is due to increased intrapleural pressure, and which, because of the patency of the bronchi, disappears rapidly with decompression, but shall consider the more permanent atelectasis which is secondary to bronchial obstruction.

Until recently, the dense heavy shadow cast by the lung on the roentgenogram after the first few inflations was considered to be due to a pneumonic consolidation, although the usual favorable clinical course of the disease was antagonistic to such an interpretation.

Normally a partially collapsed lung is permeable to the roentgen rays, and in the presence of negative intrapleural pressure will expand with inspiration and collapse with expiration. This is particularly true of the less involved portion of the lung.

When lobar atelectasis occurs, the dense shadow representing the airless lung does not respond to the respiratory efforts in spite of the negative intrapleural pressure. Moreover, when atelectasis supervenes, the shrinkage in the volume of the lung creates a greater negative intrapleural pressure, with the result that the mediastinal contents are sharply drawn toward the side of the pneumothorax (fig. 5). This, as can be readily seen, is due, not to the absorption of air from the pleura, for it occurs in spite of judiciously spaced refills, but to the absorption of the alveolar air distal to the plugged bronchi.

When Barlow and Kramer [17] first introduced the term "selective collapse" of the lung in tuberculosis, Hennel and Stivelman [18] showed that the providential collapse of the relatively uninvolved portion was due, on the one hand, to the diminished pulmonary distensibility and elasticity of the diseased portion, and, on the other hand, to the elastic recoil on the healthy portion.

There is every reason to believe that the rapid loss of distensibility of the involved portion of the lung is due, not to fibrosis, which is of slow evolution, but to lobular atelectasis, which is engendered with great rapidity, and it also appears that this atelectasis usually precedes the more permanent fibrosis of the lung in cases in which there has been therapeutic collapse with pneumothorax.

SUMMARY

1. Acute lobar or multilobar atelectasis is rarely seen in pulmonary tuberculosis, but it may occur when a bronchus is plugged in the course of hemoptysis.

2. Chronic lobar atelectasis may be seen in infants and children with tuberculous hilar adenopathy when the glands exert sufficient pressure on a bronchus to interfere with the normal pulmonary drainage.

3. Chronic massive atelectasis in phthisis is usually confounded with extensive unilateral pleuropulmonary fibrosis. The patients usually have a benign course, although their sputum may often show the presence of tubercle bacilli.

4. When respiratory distress develops as a result of the displaced mediastinal contents or when symptoms of activity supervene, patients with chronic massive tuberculous atelectasis can be effectively treated with induced pneumothorax. The pleura in such cases is usually free from extensive adhesions.

5. Lobular or confluent lobular atelectasis is of the most frequent occurrence in all stages of pulmonary

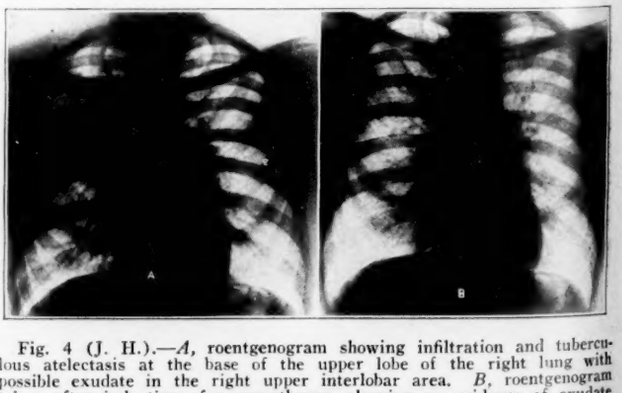

Fig. 4 (J. H.).—*A*, roentgenogram showing infiltration and tuberculous atelectasis at the base of the upper lobe of the right lung with possible exudate in the right upper interlobar area. *B*, roentgenogram taken after induction of pneumothorax, showing no evidence of exudate in the right upper interlobar area.

14. Bruns, O.: Ueber die Blutzirkulation in der atelektatischen Lunge, Deutsches Arch. f. klin. Med. **108**: 469, 1912.
15. Coryllos, P. N., and Birnbaum, G. L.: The Circulation in the Compressed Atelectatic and Pneumonic Lung, Arch. Surg. **19**: 1346 (Dec., pt. 2) 1929.
16. Sauerbruch, F.: Die Chirurgie der Brustorgane, ed. 2, Berlin, Julius Springer, 1920, vol. 1.
17. Barlow, N., and Kramer, D.: Selective Collapse under Partial Pneumothorax, Am. Rev. Tuberc. **6**: 75 (Nov.) 1922.
18. Hennel, H., and Stivelman, B. P.: So-Called Selective Collapse in Artificial Pneumothorax, Am. Rev. Tuberc. **7**: 291 (July) 1923.

tuberculosis. The narrowing of the interspaces at the site of the lesion, the deviation of the mediastinum toward the lesion and the elevation of the homolateral portion of the diaphragm in early cases are due, not, as has been heretofore supposed, to fibrosis, which is of slow evolution, but to lobular atelectasis, which develops with great rapidity in any tuberculous pulmonary area.

6. The great frequency of lobular or confluent lobular atelectasis in pulmonary tuberculosis appears to indicate that it is one of nature's ways of initiating fibrosis in the involved area.

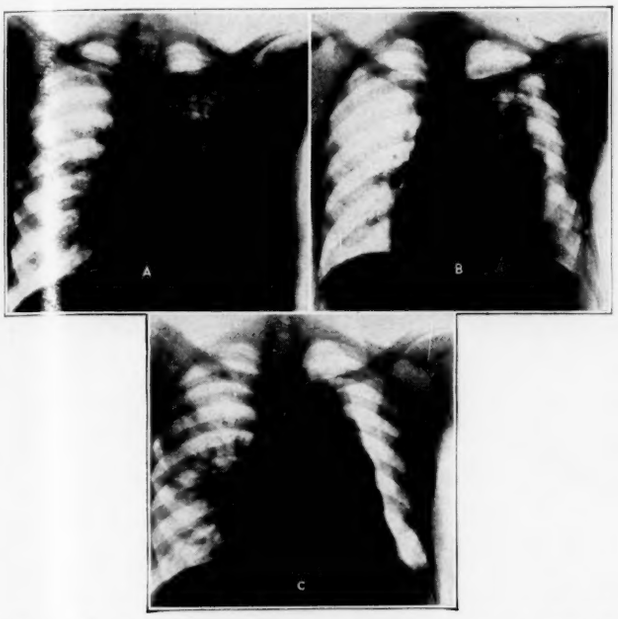

Fig. 5 (W. H.).—*A*, roentgenogram showing massive recent tuberculization of the lower two thirds of the left lung. The trachea and heart are pulled to the left because of atelectatic changes in the lungs. *B*, roentgenogram taken six days after therapeutic pneumothorax showing few pleural adhesions. The mediastinal contents are markedly displaced to the right. Atelectasis has partially cleared. *C*, roentgenogram taken one week later, after further pleural insufflation, showing mediastinal displacement to the right less marked because of renewed massive atelectasis of the left lung.

7. Lobar or multilobar atelectasis in the course of artificial pneumothorax is apparently a beneficial process and leads to a better collapse and early fibrosis of the treated lung.

ABSTRACT OF DISCUSSION

DR. L. R. SANTE, St. Louis: There can be no doubt that atelectasis plays a great and important part in tuberculosis. It seems to me that tuberculous infection lends itself particularly well to the development of this condition. The slow, insidious character of the growth of tuberculous granulations in the bronchi and bronchioles, with resultant occlusion, makes it quite evident that it should play an important part in pulmonary tuberculosis. Dr. Stivelman has shown massive consolidations, namely, atelectasis in the process of formation. I think the same thing holds true of smaller areas as well; smaller triangular consolidations from atelectasis which have often been attributed to infiltration. I think this is just the beginning of an enlightenment on a subject which will prove of great benefit to those engaged in this work. I have had experiences similar to those shown by the author, in which a whole side was atelectatic, which condition had been at first attributed to interstitial fibrosis, with retraction of the trachea and narrowing of the interspaces, elevation of the diaphragm, and so on. When pneumothorax was induced, complete collapse of the lung resulted and the trachea and other mediastinal structures assumed their normal positions, indicating, of course, that the condition was not due to the fibrosis but to atelectasis. One must be cautious, though, and not get the impression that massive fibrosis of the lung does not occur, because diffuse interstitial fibrosis of the lung is a well recognized clinical entity with evidence borne out by necropsy. It does occur. The induction of pneumothorax to attempt aeration in such cases may be extremely dangerous. I have seen a number of instances in which death promptly resulted from attempts at aeration in such cases. I think that those accidents can be avoided if extreme care is taken and the operation is done with a manometer. I have induced pneumothorax without mishap in cases similar to those seen here today. I think that as much consideration may not have been given to the possibilities of atelectasis as a cause of many of the small areas of infiltration seen in the lung. In recent years I am sure that every one has been impressed with the absorption of tuberculous exudates as seen in serial roentgenograms. I wonder how much of this resolution that one sees really amounts to aeration of atelectatic areas by the shrinking of small tuberculous granulations which occlude small bronchioles of the lung. I should like Dr. Stivelman to say what his opinion has been with reference to the absorption of exudate and the possible relationship to actual atelectasis in small areas.

DR. HENRY K. PANCOAST, Philadelphia: I am wondering whether the nomenclature is exactly correct in connection with some of the lungs that are only partly collapsed after pneumothorax. I notice that some of them are rather dense. Why should an atelectatic lung collapse only part way and remain dense if atelectasis alone is the condition present? The question arises whether there is not absorption of air and drowned lung as well.

DR. LAWRENCE REYNOLDS, Detroit: Atelectasis occurs in tuberculosis, I believe, much more frequently than is supposed. In a sanatorium in Detroit where there is an opportunity to observe many cases of tuberculosis, atelectasis is a frequent occurrence. As Dr. Stivelman has pointed out, the atelectasis, within a few days, clears up completely and apparently without any ill effects. I remember a case that had been under observation for several years, in which there had been three distinct complete collapses of the left lower lobe, and at the last examination, made about four weeks ago, the lower lobe was practically clear except for a minimal amount of parenchymal involvement. Most of the pulmonary involvement had been in the lower part of the left upper lobe. Dr. Gordon Richards of Toronto, a few days ago, in discussing the question of tuberculosis and collapse, called attention to an observation which he had made, of a faint line which one often sees in the lower part of the lower lobe extending from the root of the lung toward the base, apparently as frequently on the left side as on the right. The line extends down from the root of the lung close in to the shadow of the spine. These shadows have often been difficult to understand. He has proved that these shadows represent total collapse of the lower lobes, and the upper lobes tend to press the collapsed lung against the spine or close to the heart, and the upper lobe, if the collapse happens to be on the left side, occupies a space that was occupied by both lobes before. Dr. Richards and his co-workers have introduced iodized oil into these collapsed lower lobes and have shown that they are often associated with bronchiectasis, and apparently the collapse of the lower lobe has extended over a long period of time. Some shadows which have been so puzzling in that portion of the chest are certainly made clear to those who had the opportunity to see these cases. Dr. Richards has explained the clinical appearance of this phenomenon and has also been able to produce it experimentally.

DR. J. L. DUBROW, Memphis, Tenn.: There seems to be some confusion about this term "atelectasis." The question comes up whether in making a diagnosis one is to take the roentgenologist's report only. Are there not some other data that can be used in the diagnosis of atelectasis? In a case of atelectasis there should be a high intrapleural negative pressure on the affected side, and there should be bronchial obstruction. In a paper to appear shortly in the *American Review of Tuberculosis*, I point out that atelectatic shadows may be due to some other condition. I have had several cases in which, so far as appearance is concerned, there is on the roentgenogram an opaque unilateral shadow with a high elevated diaphragm. The trachea and the heart are drawn to the affected side. If a

pleural puncture or pneumothorax is attempted, no fluid or reading is obtained. In some of these cases bronchoscopy was done and no obstruction was found. I think that the pathologic condition in these cases was pulmonary fibrosis. In regard to another phase of the subject, there are certain therapeutic methods used, such as oleothorax, which may give a confusing roentgenogram. In one case an extensive left-sided pleural effusion proved to be tuberculous. I removed some of the pus and replaced it with gas, making a pyopneumothorax, and later converted it into an oleothorax. The heart, which was initially shifted to the right as a result of the extensive effusion, was drawn to the left side under the oleothorax treatment, owing to stabilization of the mediastinum and pleural thickening. As a result, the roentgenogram showed an "atelectatic" shadow due in this case to oleothorax.

DR. JOHN W. PIERSON, Baltimore: I should like to make an observation that is not original but is, perhaps, timely. The routine employment of examination of the chest from lateral and semilateral positions will frequently serve to differentiate exudates from localized areas of atelectasis.

DR. BARNET P. STIVELMAN, New York: Dr. Sante raises the question as to whether rapid absorption of an exudate may not in reality be due to the disappearance of an atelectatic area. This is precisely what I think occurs more often than has been realized until recently. On a visit to a sanatorium I saw a patient in January with a tuberculous pneumonia, which disappeared in February. It is known that tuberculosis does not clear so rapidly. What the patient had was an atelectatic area, which cleared as a result of coughing. Indeed, it might have cleared up much faster had the patient not been kept perfectly at rest and prevented from coughing. Dr. Pancoast raises the question whether there may not be something underlying the atelectasis in view of the shadows on the roentgenogram. I think he is quite right. All these patients had extensive tuberculous processes and none had a negative sputum. I have been asked whether I can prove that our patients had atelectasis. There are two possible proofs. One is through bronchoscopy and the other is the presence of high negative intrapleural pressure. This is precisely the reason why I showed only those patients in whom artificial pneumothorax was induced. In each of these cases the pressure was highly negative. Even if it were desirable, it is not very likely that the bronchoscope would have shown much, because it is not possible to reach the smaller bronchi, occlusion of which is the cause of lobular atelectasis. There are several points in the differential diagnosis of fibrosis and atelectasis that bear reiteration. In the first place, in patients with extensive unilateral fibrosis there is a definite history, either of an undoubted pneumonia or of an induced or spontaneous pneumothorax followed by an effusion, or an empyema that was drained with or without incision. Extensive unilateral fibrosis in tuberculosis is uncommon because tuberculosis is essentially a bilateral disease. When the disease has progressed so far as to involve an entire lung and its pleura, it is very unlikely that the opposite side will be perfectly free from tuberculosis. In the absence of such a history and in the absence of a lesion on the opposite side, it is perfectly fair to make a diagnosis of atelectasis and with extreme caution to determine the intrapleural pressure on the side involved. If there is an increase in the negative pressure, one is dealing with an atelectatic process.

Radiology.—Apart from bacteriology, which, like medicine, is a biological science, no discovery in pure science has been of such signal service to the practice of surgery and medicine as that of x-rays in November, 1895, by W. K. von Roentgen (1845-1923), professor of physics at Würzburg. Utilized with such success in diagnosis that failure to appeal to skiagraphy in some surgical conditions, such as fractures, may constitute professional neglect, x-rays were later employed therapeutically in many conditions; but its help in diagnosis is both more successful and more widespread than in treatment. An invaluable addition to physical examination, it is to some extent more effective than the older methods of auscultation and percussion.—Rolleston, Sir Humphry: The Changes in the Medical Profession and Advances in Medicine During the Last Fifty Years, *Brit. M. J.* **2**:133 (July 23) 1932.

CARCINOMA IN SITU CONTRASTED WITH BENIGN PENETRATING EPITHELIUM

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Before I undertake to point out the importance of bringing into the category of carcinoma certain so-called entities that for the most part have remained outside of this category and to exclude from this category epithelial hyperplasia that is not of carcinomatous nature, I believe it is essential to emphasize established facts. These are that the entity called carcinoma or cancer, regardless of etiology, is a primary disease of epithelial cells, and that all other phases and sequelae, although of great importance, are in reality of secondary nature.

Carcinoma in situ is a condition in which malignant epithelial cells and their progeny are found in or near positions occupied by their ancestors before the ancestors underwent malignant transformation. At least they have not migrated beyond the juncture of the epithelium and connective tissue or the so-called basement

Fig. 1.—Squamous cell carcinoma in situ of the uterine cervix, in which the carcinomatous cells have replaced the normal cells and are appearing to function in a protective manner. There is no penetration of the so-called basement membrane; therefore, according to older teaching, the growth would be considered noncarcinomatous, or at most only precarcinomatous.

membrane; such migration would be manifested by the cells entering the connective tissue interstices or any part of the blood or lymph vascular systems. The intraepidermal epithelioma of Borst [1] and Jadassohn [2] should come within the foregoing definition of carcinoma in situ. In adenocarcinoma in situ the malignant cells often completely replace the nonmalignant cells in what were once normal acini, ducts or tubules. The replacement in these structures is particularly noticeable in secondary cytoplasia, as noted by MacCarty.[3] Complete replacement is less frequently observed in carcinoma of the protective epithelium. However, it does occur and may cause the microscopist some confusion by appear-

From the Section on Surgical Pathology, the Mayo Clinic.

Read before the Section on Pathology and Physiology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

1. Borst: Ueber die Möglichkeit einer ausgedehnten intraepidermalen Verbreitund des Hautkrebses, Verhandl. d. deutsch. path. Gesellsch. **7**: 118-123, 1904.

2. Jadassohn, J.: Demonstration von selteneren Hautepitheliomen, Beitr. z. klin. Chir. **136**: 345-358, 1926.

3. MacCarty, W. C.: The Histogenesis of Cancer (Carcinoma) of the Breast and Its Clinical Significance, Surg., Gynec. & Obst. **17**: 441-459 (Oct.) 1913.

ing to function as normal protective epithelium. Hansemann [4] expressed the belief that transformation of a nonmalignant cell into a malignant cell takes place by a process of dedifferentiation, which he called anaplasia.

The diagnosis of carcinoma in situ, as of carcinoma in general, is based chiefly on altered cellular characteristics in contradistinction to the cellular situation. The

Fig. 2.—Squamous cell carcinoma in situ of the surface epithelium of the nipple, or Paget's disease.

nuclei, as compared with those of normal cells, have an increased avidity for the basophilic dyes, are usually increased in size, both actually and in relation to the cytoplasm, are frequently irregular, are not infrequently in a state of atypical or pathologic mitosis and are occasionally observed in groups in the form of tumor giant cells.

Carcinoma in situ may manifest itself as of any type, such as squamous cell carcinoma, basal cell carcinoma or adenocarcinoma; it may occur in any situation in which carcinomas arise and may be of any degree of malignancy. It is particularly noticeable in Paget's [5] disease of the breast and of the extramammary epidermis, a condition characterized microscopically by the presence of so-called Paget's cells. Since Paget's disease is such an interesting condition and has been responsible for so much diversity of opinion, I feel that I should take this opportunity to digress from the main theme of this paper in order briefly to consider it. Like other forms of carcinoma, it comes into existence by dedifferentiation of epithelial cells which have not differentiated beyond the point of reproduction. It appears to be practically limited in its origin to protective or closely allied epithelium. For purposes of classification, it seems reasonable to classify Paget's disease with the squamous cell or epidermoid type of carcinoma. Some of the cells in Paget's disease unquestionably have the intercellular bridges to which Civatte [6] called attention. Arnd [7] and Gans [8] noted direct transition between normal prickle cells and so-called Paget's cells. An interesting feature of so-called Paget's cells, which are unquestionably carcinomatous cells, in contradistinction to degenerating noncarcinomatous cells, is that a number of Paget's cells show evidence of individual cellular differentiation as manifested by partial or complete keratinization of the cytoplasm. Darier [9] interpreted these cells with keratinized cytoplasm as micro-organisms (psoropsperms), but he later abandoned this view and finally interpreted them as evidence of dyskeratosis. After analyzing the microscopic data in reports of cases of extramammary Paget's disease, Montgomery [10] came to the conclusion that most of the cases, especially those in which the scrotum, penis and perineum were involved, were frank cases of squamous cell epithelioma, in which keratinization of individual cells had taken place. Kreibich [11] and Audry [12] considered the Paget cell as a mole cell or melanoblast. Although the so-called Paget's cells do to some extent resemble cells that are sometimes found in moles and melanocarcinomas, the finding of partially or completely keratinized cytoplasm in the cells of the latter lesions would be unusual. Evidence of differentiation, as manifested by the presence of intercellular bridges and keratinization in the cells in Paget's disease, may account for the relatively low degree of clinical malignancy of the disease. Keratinization of individual cells may be observed in squamous cell or epidermoid carcinomas, without conglomeration into pearly bodies. In keratinization of individual cells in ordinary squamous cell carcinoma, the nucleus is often completely destroyed, whereas in Paget's disease destruction is rarely complete; however, the nucleus may be so impaired that it loses its ability to reproduce. It would be unusual to see the nucleus of a cell in a dividing state, either direct or indirect, and the cytoplasm in a state of complete keratinization.

It is well known that in Paget's disease of the breast there is usually, but not always, associated adenocarcinoma of the deeper portions. Paget's carcinoma is

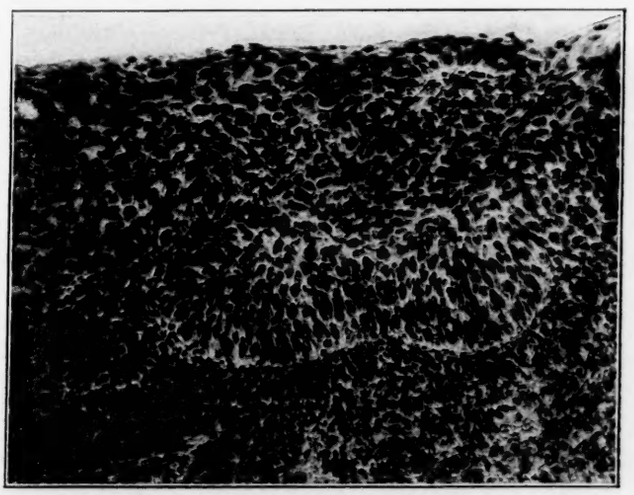

Fig. 3.—Squamous cell carcinoma in situ of the larynx.

observed in the epidermis of the nipple and areola, and may, in advanced cases, involve the periareolar epidermis for some distance. It also involves the lactiferous

4. Hansemann, David: Ueber asymmetrische Zelltheilung in Epithelkrebsen und deren biologische Bedeutung, Virchows Arch. f. path. Anat. **119:** 299-326 (Feb. 4) 1890.

5. Paget, James: On Disease of the Mammary Areola Preceding Cancer of the Mammary Gland, St. Barth. Hosp. Rep. **10:** 87-89, 1874.

6. Civatte, A.: Un cas de maladie de Paget de l'aisselle avec cancer: (Le cancer nœvo-carcinoïde de la maladie de Paget), Bull. Assoc. franç p. l'étude du cancer **17:** 297-314, 1928.

7. Arnd, Willi: Ueber die Pagetsche Erkrankung der Brustwarze, Virchows Arch. f. path. Anat. **261:** 700-731 (Sept. 30) 1926.

8. Gans, quoted by Bloch, Bruno: Cancer Rev. **7:** 65-98 (Feb.) 1932.

9. Darier, J.: Sur une nouvelle forme de psorospermose cutanée: La maladie de Paget, du mamelon, Compt. rend. Soc. de biol. **41:** 294-297, 1889; Le cancer des dyskératoses: Maladie de Paget et maladie de Bowen, Bull. Assoc. franç. p. l'étude du cancer **9:** 169-187, 1920; Note sur la dyskératose, en particulier dans la "Maladie de Paget," Bull. Soc. franç. de dermat. et syph. **32:** 1-6, 1925.

10. Montgomery, Hamilton: Superficial Epitheliomatosis, Arch. Dermat. & Syph. **20:** 339-357 (Sept.) 1929.

11. Kreibich, C.: Ueber die Paget-Zelle, Arch. f. Dermat. u. Syph. **163:** 467-471 (July 21) 1931.

12. Audry, C.: Sur un cas d'épithéliomatose de Paget à forme pigmentaire; une théorie du cancer du sein, Ann. de dermat. et syph. **7:** 529-535, 1906.

ducts of the nipple, and various observers, including myself, have noted its presence in the regenerative cells of the regional sebaceous glands and hair follicles. The cells of Paget's disease of the lactiferous ducts of the nipple are for the most part indistinguishable from those in the epidermis; however, some of them are more like those found in adenocarcinoma, and are arranged in an alveolar or acinar fashion, with or without papillary projections. It seems reasonable, therefore, to class the condition in the ducts of the nipple as a mixed epidermoid carcinoma and adenocarcinoma. The growth in the depths of the breast is of the type of adenocarcinoma; however, frequently the cells in the ducts have an angular or a stellate appearance suggestive of epidermoid carcinoma. This appearance is so striking at times that without any other evidence associated Paget's carcinoma of the nipple would be strongly suspected. The cells without epidermoid appearance are like those found in the usual adenocarcinoma of the breast that is unassociated with Paget's disease. Considering the fact that the epithelial cells in the depths of the breast are so closely related biologically to those of the epidermis and ducts of the nipple, it is remarkable that squamous cell carcinoma or epidermoid carcinoma does not arise from them with greater frequency. In contrast to Paget's carcinoma, which is usually in situ, adenocarcinoma in the deeper portions of the breast, although it may occur in situ, usually shows evidence of having entered the interstices of the connective tissue or some part of the lymph or blood vascular systems. When metastasis occurs in the regional lymph nodes in a case of Paget's carcinoma, associated with adenocarcinoma in the deeper portions of the breast, it is well known that the metastasis is usually of the adenocarcinomatous type, and that this fact is an indication that adenocarcinoma is more malignant than Paget's carcinoma. Various observers have pointed out that adenocarcinoma in the depths of the breast may invade the region occupied by Paget's carcinoma. Such invasion has confused the microscopic picture and has served as a bone of contention between those who hold that Paget's carcinoma is secondary to a carcinoma in the depths of the breast and those who hold that it is not. This secondary invasion, however, has no more significance than the invasion of a similar region by a deep-seated adenocarcinoma in a breast in which there is no Paget's carcinoma.

I am in agreement with those who hold that the lesion which bears the name of Paget's disease and which is characterized by the presence of so-called Paget's cells, regardless of situation, is carcinomatous and not precarcinomatous (Thin,[13] Duhring and Wile,[14] Karg,[15] Sekiguchi,[16] Bloodgood,[17] Masson,[18] Muir,[19] Pautrier,[20] Drake and Whitfield,[21] Cheatle and Cutler[22] and others). When Paget's disease is associated with an

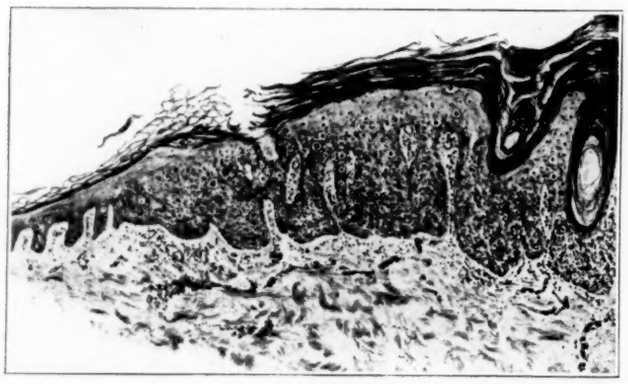

Fig. 4.—Squamous cell carcinoma in situ of the skin, or Bowen's disease. (Reproduction of photomicrograph from one of Bowen's first two cases.)

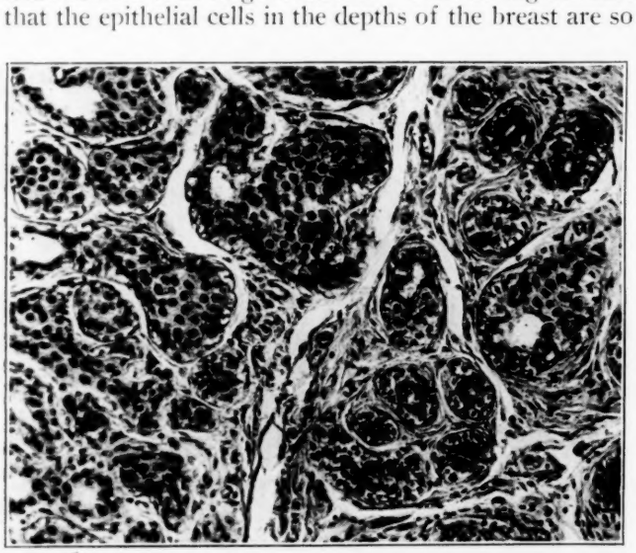

Fig. 5.—Adenocarcinoma in situ of the breast, or MacCarty's secondary cytoplasia. In most of the acini the undifferentiated or carcinoma cells have replaced the normal cells. In a group of acini in the lower right portion there is no malignant change.

Fig. 6.—Adenocarcinoma in situ in an adenoma of the rectum. The carcinomatous cells are only slightly dedifferentiated, and are therefore of a low degree of malignancy.

13. Thin, George: On the Connection Between Disease of the Nipple and Areola and Tumours of the Breast, Tr. Path. Soc. London **32**: 218-227, 1881.

14. Duhring, L. A.: Two Cases of "Paget's Disease of the Nipple," Am. J. M. Sc. **86**: 116-120 (July) 1883. Duhring, L. A., and Wile, Henry: On the Pathology of Paget's Disease of the Nipple, ibid. **88**: 141-149 (July) 1884.

15. Karg, C.: Ueber das Carcinom, Deutsche Ztschr. f. Chir. **34**: 133-186, 1892.

16. Sekiguchi, S.: Studies on Paget's Disease of the Nipple and Its Extramammary Occurrence: Reports of Eighteen Cases Personally Investigated, Ann. Surg. **65**: 175-198 (Feb.) 1917.

17. Bloodgood, J. C.: Paget's Disease of the Female Nipple: A Preventable Disease, Curable in Its Early Stages; A Study of Thirty Cases, Arch. Surg. **8**: 461-505 (March) 1924.

18. Masson, P.: Considérations sur la maladie de Paget, Bull. Soc. franç. de dermat. et syph. **32**: 6-18, 1925.

19. Muir, Robert: Paget's Disease of the Nipple and Its Relationships, J. Path. & Bact. **30**: 451-471, 1927.

20. Pautrier, L. M.: "Paget's Disease of the Nipple": A True Cancer Tending to Invade the Epidermis and Necessitating Total and Early Amputation of the Breast, Arch. Dermat. & Syph. **17**: 767-790 (June) 1928.

21. Drake, J. A., and Whitfield, Arthur: Paget's Disease of the Vulva, Brit. J. Dermat. **41**: 177-187 (May) 1929.

22. Cheatle, G. L., and Cutler, Max: Tumors of the Breast, London, Edward Arnold & Co., 1931, pp. 333-454.

adenocarcinoma in the deeper portions of the breast, I am of the opinion that the whole carcinomatous process, from the surface epithelium of the nipple to the depths of the breast, aside from the probability of a common etiologic background and regardless of chronological relationship, arises by dedifferentiation of the epithelium

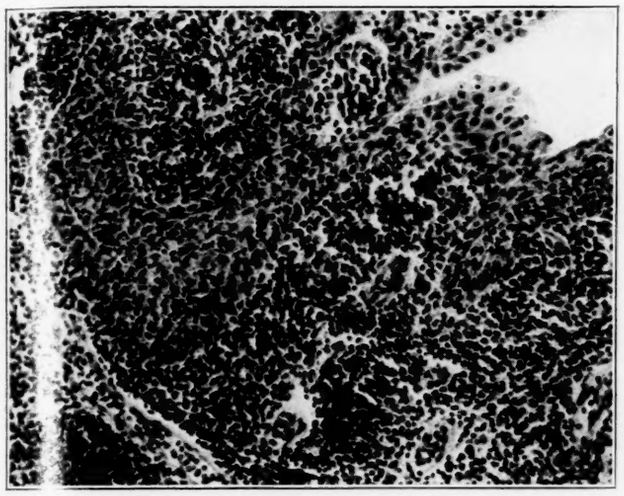

Fig. 7.—Benign, penetrating epithelium associated with an inflammatory process of the vagina. The nuclei, as compared to those of carcinoma in situ, are smaller, both actually and in relation to the cytoplasm, more regular in outline, have less affinity for the basic dye and are free from atypical or pathologic mitosis.

existing in the various situations. The foregoing conclusions are in agreement with those so well expressed by Cheatle in 1923 as follows: "(1) Paget's disease of the nipple is carcinoma; (2) carcinoma in the depth of the breast, with which Paget's disease of the nipple is usually associated, is a primary carcinoma of the breast epithelium, and (3) the connection between the two lesions is that the agent which is inducing Paget's disease on the surface is also concerned in inducing pri-

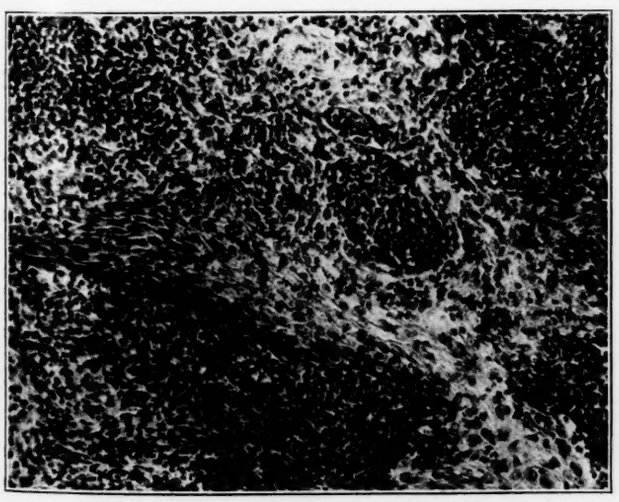

Fig. 8.—Benign penetrating epithelium associated with blastomycosis of the skin.

mary carcinoma in the epithelial cells of the underlying breast."

In their monograph on "Tumors of the Breast," Cheatle and Cutler expressed themselves in a similar vein. They furthermore pointed out that for Paget's disease to be typical "the formation of 'Paget's cells' from preexisting epidermic cells is essential"; however, they were not sure whether the formation of Paget's cells "is part of a process of neoplasia or merely a process of degeneration."

For those who are interested in a constructive critical review of the literature pertaining to Paget's disease, they will find the articles by Deaver and McFarland [23] and Bloch [24] instructive.

Other examples of carcinoma in situ are the secondary cytoplasia noted by MacCarty and the so-called precancerous dermatosis of Bowen.[25] The condition may also be found associated with senile keratosis, arsenical keratosis, chemical dermatosis, actinodermatitis and xeroderma pigmentosum. Careful microscopic examination in the latter conditions unquestionably should increase the recorded incidence of carcinoma in situ in association with them.

If, in a specimen obtained for biopsy, carcinoma in situ is associated with infiltrating carcinoma, there is little chance of missing the diagnosis of carcinoma. However, if carcinoma in situ appears alone, its recognition is necessary, for failure to recognize it may constitute an error of omission fraught with grave danger

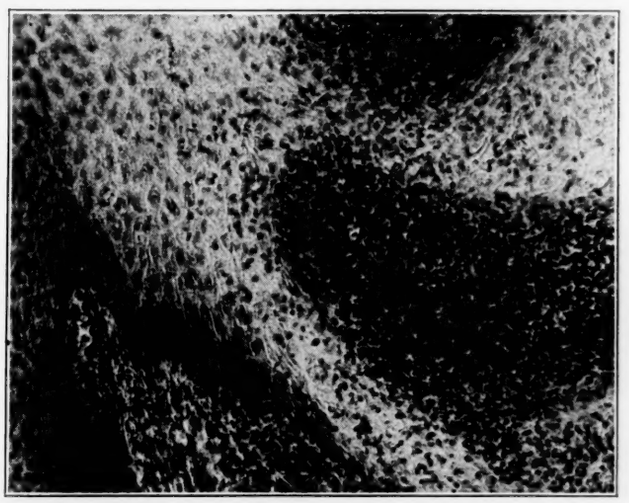

Fig. 9.—Benign penetrating epithelium associated with an inflammatory lesion of the lip.

to the patient; if it goes unrecognized, carcinoma is allowed to masquerade as a benign or not more than a precarcinomatous process, with the possibility of its becoming too far advanced to be amenable to treatment.

Benign penetrating epithelium is characterized by nonmalignant hyperplasia that results from response to a stimulus. The epithelial cells in this condition, although they may penetrate far beyond the normal level of the juncture of the epithelium and the connective tissue and may be greatly increased in number, have retained the characteristics of normal epithelial cells. Benign penetrating epithelium is observed in healing wounds, in chronic ulcers, in regions of simple chronic inflammation and in granulomatous conditions such as tuberculosis, syphilis, blastomycosis and actinomycosis. It also occurs as the result of stimulation by various chemical substances. At this point, I should like to call attention to an excellent article by White and Weid-

23. Deaver, J. B., and McFarland, Joseph: The Breast: Its Anomalies, Its Diseases, and Their Treatment, Philadelphia, P. Blakiston's Son & Co., 1917, pp. 686-702.

24. Bloch, Bruno: Cancers and Precancerous Affections from the Dermatological Viewpoint, Cancer Rev. **7**: 65-98 (Feb.) 1932.

25. Bowen, J. T.: Precancerous Dermatoses: A Study of Two Cases of Chronic Atypical Epithelial Proliferation, J. Cutan. Dis. **30**: 241-255 (May) 1912; Precancerous Dermatoses: A Sixth Case of a Type Recently Described, ibid. **33**: 787-802 (Dec.) 1915.

man,[26] in which they emphasized the importance of distinguishing epithelial hyperplasia from carcinoma on the margins of cutaneous ulcers. Owing to the influence of older teaching, some pathologists contend that epithelium which has penetrated beyond the juncture of the epithelium and connective tissue, or so-called

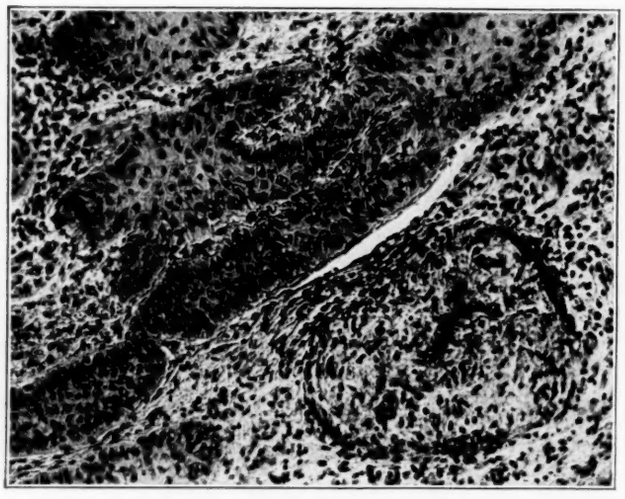

Fig. 10.—Benign penetrating epithelium associated with tuberculosis of the anus. The epithelial cells in this picture, although they are not malignant, have a more active appearance than those in figures 7, 8 and 9.

basement membrane, should be considered malignant. As a result of this misinterpretation, errors of commission are made, which are followed by subjection of the patient to unnecessary treatment. Furthermore, the mental agitation of the patient and the patient's relatives, resulting from the error and from the unnecessary treatment, must be seriously considered.

In conclusion, it seems pertinent to state that the day has passed when epithelium can be considered noncarcinomatous or at the most only precarcinomatous because it is within the confines of the so-called basement membrane and, conversely, carcinomatous because it has penetrated beyond this barrier. It is therefore imperative that the microscopist take into consideration the character of the epithelial cells above everything else in order to arrive at a correct diagnosis.

ABSTRACT OF DISCUSSION

DR. MAX CUTLER, Chicago: I think that Dr. Broders has called attention to an important biologic problem related to neoplasms. I am glad to note that his views conform precisely to views held by Sir Lenthal Cheatle concerning Paget's disease of the nipple. In describing the morphologic changes preceding cancer of the breast, Sir Lenthal Cheatle and I have taken the position that the epithelium that is still confined within the ducts and acini possesses all the morphologic appearances of cells that have invaded outside structures. The presence of the malignant state can be determined only by the fact that the cells have invaded outside structures. As regards Paget's disease of the nipple, I should like to call attention to Muir's observation; namely, that carcinoma cells may migrate and invade other epithelial cells. Muir suggests that in Paget's disease of the nipple the "Paget's cells" represent an intra-epithelial invasion of the epidermis by cells that have originated in the opening of a duct. Shaw-Dunn has recorded an interesting example of carcinoma of the anus with mucoid cells in which a similar intra-epithelial invasion has occurred in the surrounding epidermis. These observations are in accord with Dr. Broders' view that carcinoma may exist although it is still confined within its basement membrane. The question of invasion by benign epithelial cells is exceedingly interesting. In so-called plasma cell mastitis an intense inflammatory process is associated with a pronounced epithelial hyperplasia. In many examples the epithelium appears to be invading the connective tissue, yet the lesion is entirely benign and represents a marked response of the epithelium to an intense inflammation. An adenoma of the breast under the influence of pregnancy sometimes undergoes remarkable changes in which epithelial cells in groups and sometimes single appear to invade the surrounding fat. This is another example of apparent invasion by a benign process.

26. White, Cleveland, and Weidman, F. D.: Pseudo-Epitheliomatous Hyperplasia at the Margins of Cutaneous Ulcers, with Especial Reference to Histologic Diagnosis, J. A. M. A. **88**: 1959-1963 (June 18) 1927.

LARGE CYSTS OF THE SPLEEN

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Cysts of the spleen are sufficiently rare that the report of an additional case, in which the diagnosis was correctly made before operation, is felt to be justified.

REPORT OF CASE

A housewife, aged 28, seen Aug. 20, 1930, complained of a tumor below the left breast. She was married seven years before, and had three healthy children. There had been no contact with tuberculosis and no injuries. In 1920, an appendectomy was done. Following indefinite left sided pleurisy in 1926, she noticed a painless swelling below the left breast, without skin changes. This gradually increased in size until six months before admission when more rapid enlargement was noticed. She then began to have pain in the back, a sense of numbness in the left arm, and some tiredness. Her appetite was poor, but the only digestive disturbance was considerable flatulence. There were no cardiorespiratory symptoms except some palpitation with excitement. During the past year she had frequency, as often as fifteen times during the day, and occasional nocturia but no dysuria. Her menstrual history was negative.

Fig. 1.—Displacement of the stomach and the intestine to the right.

On examination, no evidence of her former "pleurisy" was found. There was a dome-shaped swelling in the left upper quadrant beneath the costal margin, extending from the midline in front, downward and backward almost to the spine, and to within two fingerbreadths of the left iliac crest. The lower edge of this mass was rounded, firm, not tender, and a distinct notch was felt in the nipple line. In the upper part of the mass was a soft area over which the percussion note was tympanitic; the rest of the mass was firm, smooth, not tender, and dull on percussion. There were no abnormal pulsations, skin changes or respiratory movements. Somewhat below and to the left of the umbilicus was an easily moveable, hard, nodular, nontender mass the size of a plum, not demonstrably connected with the large tumor. The liver and kidneys were not felt.

From the Department of Preventive Medicine, A. O. Smith Corporation.

There was no enlargement of the superficial lymph glands. An old transverse laceration of the cervix with marked erosion and profuse purulent discharge was present, but the uterus was in normal position, and the adnexa were not felt. Three urine analyses were negative. Examination of the blood revealed: red blood cells, 4,580,000; hemoglobin, 87 per cent; white blood

Fig. . —Downward displacement of the splenic flexure by the cystic spleen; .rium sulphate enema.

cells, 8,.00; polymorphonuclears, 63 per cent; basophils, 1 per cent; small lymphocytes, 34 per cent; large mononuclears, 1 per cent, and transitional cells, 1 per cent. The Wassermann and Kahn tests were negative.

Roentgen examination showed displacement of the lower third of the esophagus to the right, complete displacement of the stomach to the right of the spine, and also distinct displacement of the distal duodenum and jejunum to the right. The stomach was low in position, and hypotonic, with sluggish peristalsis. Along the greater curvature and posterior wall the shadow was irregular, apparently because of extrinsic pressure. The splenic flexure at twenty-four hours was below the level of the hepatic flexure, and in the left upper abdomen there was an unusual density, greater than that of the liver on the right side. A barium enema confirmed the downward displacement of the splenic flexure but showed no evidence of pathologic changes in the large bowel. In an intravenous pyelogram with iopax, the right kidney pelvis and ureter appeared normal. The left kidney was not seen in the expected position, but the lower ureter was distinguished, and opposite the fourth lumbar vertebra there was a faint shadow representing the pelvis and the calices. The study with iopax showed displacement of the left kidney, but apparently fairly normal function and size, thus excluding polycystic kidney. Excretion of phenolsulphonphthalein was 45 per cent in the first hour and 15 per cent in the second hour. The fragility test was normal. The icterus index was 7.5, and the bromsulphalein liver function test was normal. The stools showed no soaps, fatty acids, ova or parasites. A diagnosis of splenomegaly with cystic degeneration was made, and operation was advised.

Laparotomy was performed, October 30, by Dr. Frank Darling. Incision to the left of the midline in the upper quadrant exposed a large cyst. Evacuation of the contents was necessary for adequate exposure, and 3 or 4 quarts (liters) of chocolate colored fluid under considerable pressure was removed. Examination then showed the cyst to be a part of the spleen, which was adherent to the abdominal wall, diaphragm, liver and pancreas. The dense adhesions were clamped, tied and cut, and the spleen was removed in toto. Below the splenic margin, a small nodule about the size of the end of the thumb was found, suggesting a small accessory spleen. The other abdominal organs appeared normal.

In the extirpated spleen, a large cystic area was found occupying the upper three fourths of the organ and extending medially from its origin near the hilus. The lower part of the spleen was apparently normal, the lower margin firm. The open cyst was unilocular with a smooth, glistening lining and considerable trabeculation. No splenic tissue was apparent in the capsule. Smears of the cyst fluid showed degenerated leukocytes but no bacteria, and cultures were sterile. Microscopically, the cyst capsule showed fibrous thickening and some cholesterol degeneration. Under the capsule there was moderate hemosiderosis. The spleen pulp was decidedly fibrotic with prominent thick-walled sinusoids and hyperplastic lining endothelial cells. The lymph follicles were moderately large and cellular, with occasional exhausted germinal centers. The final diagnosis was large unilocular hemorrhagic cyst of the spleen, etiology not known. The patient made an uneventful recovery following splenectomy and was discharged home on the twenty-third day.

The patient reported, Feb. 26, 1931. She appeared in good health, and said that she had had no further pain in the side, and no undue tiredness. She considered herself entirely over her former trouble. A roentgen examination at this time showed all parts of the gastro-intestinal tract in normal position. April 15, the left kidney was shown, by intravenous injection of methiodal, in the normal position, with the pelvis half a vertebra higher than the pelvis of the right kidney.

December 1, when last seen, she was eight months pregnant and had no unusual symptoms.

COMMENT

Large cysts of the spleen such as the one described are occasionally due to trauma, but in many instances the etiology remains obscure. Krekeler [1] has recently discussed trauma as a factor and has presented evidence of etiologic relationship in certain cases only. Trauma appeared to be a causative factor in only twenty-two of a series of eighty cases studied by Frank,[2] an incidence too small to prove it important in the etiology of the disease. Embolism or thrombosis of the splenic vessels has been shown to cause cyst formation, and this type has been described recently by Dobrzaniecki.[3] Other types of cyst undoubtedly start in congenital rests. It is well established that cysts of the spleen are more common in women. Of all the cases previously reported, two thirds were in women. There is often an association with pregnancy. Our patient had three normal pregnancies previous to splenectomy, and one pregnancy fol-

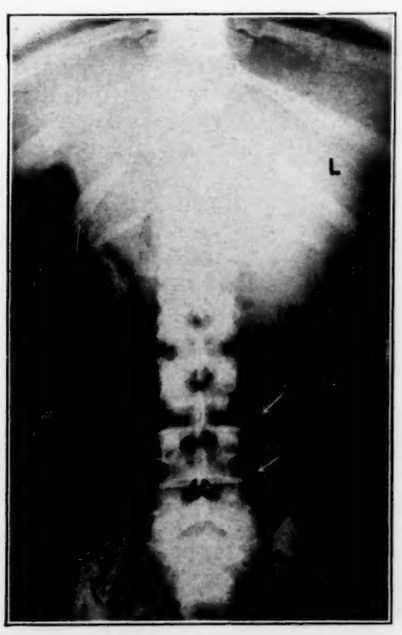

Fig. 3.—Displacement of the left kidney pelvis; iopax study.

1. Krekeler, A.: Ueber Blutungscysten der Milz, Virchows Arch. f. path. Anat. **274**: 60-84, 1929.
2. Frank, L. W.: Solitary Cysts of the Spleen, South. M. J. **23**:212-216 (March) 1930.
3. Dobrzaniecki, Wladyslaw: Multilocular Cysts Produced by Infarcts, Ann. Surg. **92**: 67-76 (July) 1930.

lowing operation. During menstruation, pregnancy and the menopause there is congestion of the spleen, and this may be a factor in the formation of cysts. Frank [2] has presented convincing evidence of the connection between menstruation and splenic congestion.

The diagnosis of cyst of the spleen has been correctly made only a few times previous to operation. In this case the roentgenogram was found a valuable adjunct

Fig. 4.—Splenic cyst: right lateral view.

to the physical examination. The downward displacement of the splenic flexure is considered almost pathognomonic of splenic enlargement, and roentgenologic study is necessary to exclude abnormality of the kidney tract. The marked displacement of the stomach, intestine and left kidney and the complete return to normal position following splenectomy is noteworthy, and, so far as I am aware, this is the only published record of a roentgenologic study made after splenectomy.

Various methods of treatment for cysts of the spleen have been in vogue. Marsupialization, puncture of the cyst and coagulation of the contents, and extirpation of the cyst have been tried, but the results, as reported by Bircher,[4] were unsatisfactory. Sanders [5] reported the successful excision of a cyst and suture of the splenic remnant. Lombard and Duboucher [6] reported successful subcapsular splenectomy. The accepted treatment at present is splenectomy. From the report of Frank [7] in 1927, and my subsequent review of the literature, it is found that splenectomy has been done fifty times in eighty-two cases of cysts of the spleen. Only one death is reported, but the outcome of operation is not positively stated in nine cases.

REVIEW OF THE LITERATURE

The literature regarding cysts of the spleen was extensively reviewed by Fowler [8] in 1910, 1913 and 1921. A classification of the various types of cysts was proposed, and the total reported cases collected from the literature. In recent years, Frank, among others, has written extensively on this subject, and collected the reported cases since Fowler's review in 1921. In 1930, Frank was able to collect eighty cases of large cyst of the spleen. I have reviewed the literature since this report and have found sixteen cases to add to this number, as follows:

A. Seven cases collected by Fowler.[9] This includes the report of a case by Lombard and Duboucher,[6] who state that they have seen sixteen additional cases similar to the case of encysted hematoma they describe, but no details are given regarding the sixteen cases. For this reason, I have not included them in the total number.

B. Eight cases reported by Mondré,[10] Erdély,[11] Brandenberg,[12] Krekeler,[1] Schneider,[13] Pohle,[14] Dinand,[15] and Dobrzaniecki.[3]

These fifteen cases, together with the case just presented, bring the total reported cases of large cysts of the spleen to ninety-six.

SUMMARY

1. A large unilocular hemorrhagic cyst of the spleen in a multipara, aged 26, was successfully removed by splenectomy. There was no history of trauma.

Fig. 5.—The spleen: anteroposterior view.

2. A total of ninety-six large nonparasitic cysts of the spleen has now been reported.

4. Bircher: Deutsche Ztschr. f. Chir. **92:** 323, 1908.
5. Sanders, A. W.: A Case of Large Single Nonparasitic Cyst of Spleen, Brit. J. Surg. **16:** 158-159 (July) 1928.
6. Lombard, P., and Duboucher, H.: J. d. chir. **20:** 464-472 (Nov.) 1922.
7. Frank, L. W.: Unilocular Cysts of the Spleen, Ann. Surg. **85:** 360-367 (March) 1927.
8. Fowler, R. H.: Nonparasitic Cysts of the Spleen, Surg., Gynec. & Obst. **11:** 133-138, 1910; Cysts of the Spleen, Ann. Surg. **57:** 658-690, 1913; Surgery of Cysts of the Spleen, ibid. **74:** 20-36 (July) 1921.
9. Fowler, R. H.: Further Study of Cysts of the Spleen, Ann. Surg. **80:** 58-61 (July) 1924.
10. Mondré, O.: Ueber Eichte Milzcysten, Zentralbl. f. Gynäk. **40:** 2111-2113 (Aug. 7) 1926.
11. Erdély, J.: Cyst Lienis haemorrhagie: Budapesti orvosi ujság **25:** 70-73 (Jan. 20) 1927.
12. Brandenberg, Rudolph: Contribution to the Knowledge of Nonparasitic Cysts of the Spleen, Acta. Chir. Scandinav. **63:** 346-373, 1928.
13. Schneider, P.: Epidermoid Cyst of Spleen with Enlargement, Verhandl. d. deutsch. path. Gesellsch. **24:** 280, 1929.
14. Pohle, Walter: Ueber Milzcysten, Deutsche Ztschr. f. Chir. **221:** 211-222, 1929.
15. Dinand, F.: Riesige epitheliale Solitärcyste der Milz, Arch. f. klin. Chir. **158:** 485-499, 1930.

REDUCED LUMBOSACRAL JOINT SPACE

ITS RELATION TO SCIATIC IRRITATION

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During the past two years it has been the routine procedure of my associates and myself to take anteroposterior and lateral x-ray pictures of the dorsal, lumbar and sacral spine, as well as an anteroposterior view of the pelvis, of all patients complaining of a painful back. The procedure was instituted because many conditions of the spine gave neither subjective symptoms nor objective findings at the level of the lesion.

Fig. 1.—Roentgenogram of a man, aged 26, suffering from first attack of severe low back pain, "lumbago." Note reduced joint space in absence of arthritic reaction seen in cases with a longer clinical course.

Fig. 2. — Roentgenogram of a woman, aged 35, who had sciatic attacks for two years, preceded by attacks of low back pain. Note reduced joint space, arthritic lipping and diminution in diameter of intervertebral foramina.

As a result of the complete roentgen study, a lesion consisting of a narrowing or a complete loss of the intervertebral disk between the fifth lumbar and the first sacral vertebra was noted in the majority of patients suffering with symptoms of sciatic irritation. Ayers [1] reported thirty-six cases of low back pain, in twenty-seven of which the patients had pain down one or both extremities, and all showed a thinning of the lumbosacral cartilage or an arthritic involvement of the facets or both. However, I believe that its frequent occurrence and clinical significance are unappreciated by the medical profession as a whole.

Sciatica (symptoms of sciatic irritation) may be either a neuralgia or a neuritis, depending on the severity and duration of the irritation. It may result from primary pathologic changes within the meninges, spinal cord or cauda equina, or it may be due to any mechanical, toxic or inflammatory irritation along the course of the nerve or the segments from which the nerve trunk is formed. It is not unusual to see sciatica resulting from inflammatory conditions in the pelvis, pelvic tumors and impacted feces. The symptoms are usually unilateral, but are occasionally bilateral; this is especially true in tumors of the cord, tabes dorsalis and diabetes.

One hundred and seven cases of sciatica were examined during 1931. Not all of the patients were seen in the Division of Bone and Joint Surgery, but of those who were, eighty-five had satisfactory anteroposterior and lateral roentgenograms of the spine. Eighty, or 94 per cent of this group, showed pathologic changes in the bones and joints which we considered sufficient to cause sciatic irritation. These were divided according to the irritating factors and are presented in the accompanying table.

Factors Causing Sciatic Irritation

Cause	Number of Cases	Male	Female
Sacro-iliac arthritis	3	1	2
Spondylolisthesis	2	1	1
Lumbosacral anomaly	1	1	0
Hypertrophic arthritis	15	11	4
Narrowed lumbosacral disk	59	35	24
Total	80	49	31

It will be noted that generalized hypertrophic arthritis was considered a causative factor in 19 per cent of the cases. This group included persons in middle and late life. Forty-seven was the average age at which symptoms appeared, and falls well within the age period of hypertrophic arthritis.

Fifty-nine patients, or 74 per cent, presented as their only finding a narrowed lumbosacral intervertebral disk with a localized arthritic reaction at this site. These were chiefly young adults, whose average age at which symptoms first appeared was 30 years. These patients undoubtedly presented the greatest degree of invalidism. It is with this group that this study is concerned. Figures 1, 2, 3 and 4 show the lesion in its various progressive stages.

A special detailed roentgen study of the lumbosacral region in the anteroposterior plane was obtained in the following way: The patient's hips and knees were flexed until the lumbar spine touched the table. The tube was placed about 2 inches (5 cm.) below a line connecting the anterior superior spines and then rotated cephalad until about a 15 degree angle was formed with the vertical axis. This, of course, varied slightly with the lumbosacral angle. Stereoscopic studies were then obtained by a lateral, rather than a vertical, shift,

Fig. 3. — Roentgenogram of a man, aged 42, who had sciatica for four years with sensory and motor changes, and attacks of low back pain for ten years. Note severe arthritic lipping, loss of joint space and constricted intervertebral foramina formed by fifth lumbar and first sacral vertebrae.

Fig. 4. — Roentgenogram of a man, aged 58. Sciatica began at age of 30. Recurring attacks for many years. None for past ten years. Note loss of joint space and natural fusion. (Retouched.)

From the Department of Surgery, University of Michigan.

Read before the Section on Orthopedic Surgery at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

1. Ayers, Charles E.: Lumbo-Sacral Backache, New England J. Med. **200:** 592-608 (March 21) 1929.

thereby permitting the rays to pass directly through the intervertebral space in both positions.

With this technic, arthritic lipping along the lateral border of the superior surface of the first sacral and the inferior surface of the fifth lumbar vertebrae was demonstrated; also, an increased sclerosis in the region of the articular facets and an occasional narrowing of the fifth lumbar body were seen (fig. 5).

A true lateral view of the lumbosacral joint is extremely important and cannot be overemphasized, since slight obliquity of the rays may so distort the region that an accurate determination cannot be made. With a careful technic, an arthritic involvement of the facets, as well as an arthritic lipping of the adjacent posterior margins of the vertebrae, which partially obstruct the intervertebral foramen, can be demonstrated.

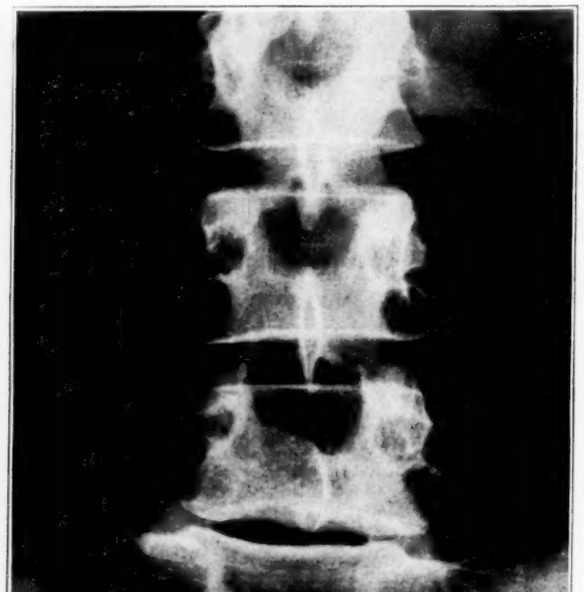

Fig. 5.—Roentgenogram of a woman, aged 29. Second attack of sciatica. Attacks of "lumbago" for two years. Note narrowed joint space, partial subluxation of lumbosacral joint, arthritic lipping and narrowing of half of fifth lumbar vertebra.

If the table presented by the superior surface of the first sacral vertebra is tilted and the inferior articular surface of the fifth lumbar vertebra is not tilted to correspond with it, the two vertebrae will be in direct contact posteriorly, while the anterior margins remain separated. The usual types seen on roentgenograms are shown diagrammatically in figure 6.

The possibility that the condition might have been present in spines which presented no clinical findings was considered. Fifteen hundred complete spinal roentgenograms were reviewed to determine this point. One type of congenital spine in this group which might be confused with the condition that has been described is that which presents a sacralization of the fifth lumbar vertebra. The lumbosacral intervertebral disk in such a case shows the narrow character of a sacral intervertebral disk. Confusion also may arise when there is a partial lumbarization of the first sacral segment. The intervertebral disk between the first and second sacral vertebrae retains its narrow character and from a lateral view may be mistaken for the lumbosacral disk. Complete x-ray pictures will reveal this anomaly. In this series, all cases showing a reduced lumbosacral joint space without the aforementioned anomalies gave a history of symptoms which we believe resulted from this lesion.

The reason a lesion at this level produces low back pain and sciatica can be best understood by a review of the anatomy of this part.

The intimate relationship of the fifth lumbar and first sacral nerve segments to the intervertebral disk at the lumbosacral junction, as well as the proximity of the psoas muscle is shown in figure 7. The quadratus lumborum and multifidus receive part of their innervation from the fifth lumbar nerve through the posterior perforating branches. This must be an important factor in muscle spasm of the lower part of the back, and, associated with a reflex spasm of the psoas muscle, probably explains the spinal rotation and list seen in sciatic irritation.

THE CLINICAL PICTURE

The history in most cases revealed that while lifting, bending or taking part in some strenuous activity the patient suddenly experienced pain in the lower part of the back. The pain, as a rule, was so severe that the patient was unable to stand erect and was confined to bed for from two to ten days. A similar attack occurred later and was repeated at irregular intervals. After from a few weeks to several months, the attacks were accompanied by pain radiating down one extremity, which after repeated exacerbations increased in severity until the patient was incapacitated for from a few weeks to several months. The more severe symptoms usually occurred in the spring or fall.

The patients complained of pain in the lower part of the back and along the posterolateral aspect of the thigh and calf, as well as on the dorsolateral aspect of the ankle and foot. This distribution of pain corresponded chiefly to the region supplied by the fifth lumbar nerve segment.

Clinical examination reveals a marked list of the spine. There is apparently no constant relationship between the affected extremity and the direction of the list. The gait favors the extremity involved, and the patient avoids complete extension of the hip and knee. There are usually muscle spasm in the lumbar region and marked tenderness over the lumbosacral joint, the sacro-iliac joint (the area supplied by the fifth lumbar through the superior gluteal nerve) and the sciatic notch on the side affected. It is usually necessary to localize the maximum point of tenderness by digital pressure, as a hasty examination may give the impression that the maximum tenderness is over the sacro-iliac joint, which is not the case and is apt to lead to the diagnosis of sacro-iliac pathologic changes with secondary nerve irritation. All motions of the spine are severely limited, particularly anterior flexion and lateral flexion to the side opposite the list. The hip presents a full range of passive motion, but there may be a limitation of active extension. Straight leg raising causes pain. There may or may not be tenderness to pressure over the nerve along its course through the posterior region of the thigh. The achilles tendon reflex is normally active, diminished or absent, while

the knee reflex is unaffected. There may be hypesthesia over the sensory distribution of the fifth lumbar segment in more severe cases or in those having a long clinical course.

Assuming that this clinical picture is due to the reduced lumbosacral joint space, one would expect to observe this finding in patients suffering from their first attack of low back pain, but as yet not experiencing sciatica. This was true in two cases. One was in a young man who entered the hospital complaining of severe low back pain which had forced him to remain in bed for the two previous days. Examination revealed marked muscle spasm in the lumbar region with a mild sciatic scoliosis and marked tenderness over the lumbosacral joint, but no evidence of sciatic irritation. Roentgen examination revealed loss of the lumbosacral joint space without the arthritic reaction seen in cases having a longer clinical course.

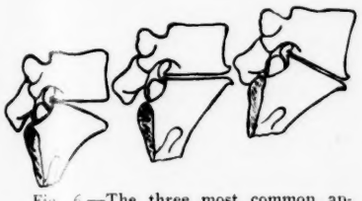

Fig. 6.—The three most common appearances of the lesion as shown by the x-rays, depending on the tilt of the superior articular surface of the first sacral and inferior articular surface of the fifth lumbar vertebrae.

In addition to the cases in which the clinical findings have been described, there were twelve patients with a narrowed intervertebral disk who gave no history of having had sciatica. This group presented symptoms which corresponded in detail to those of the other group except for the sciatic pain. They gave a history of having had severe low back pain, which most frequently began with physical exertion and as a rule occurred between the ages of 25 and 35 years. The symptoms occurred irregularly in attacks and were usually referred to by the patient as "attacks of lumbago." Examination revealed muscle spasm in the lower part of the back with marked tenderness to pressure over the lumbosacral joint. Spinal motions were limited in all directions, and anterior flexion, particularly, caused pain in the lower part of the back. Occasionally, there was sciatic scoliosis. This clinical picture was found twice as often in women as in men.

The following conclusion is therefore drawn, that loss of the lumbosacral joint space with a resultant localized arthritic reaction is a common cause of sciatica and not an uncommon cause of a severe type of low back pain.

PHYSIOLOGY AND FUNCTION OF THE LUMBOSACRAL JOINT

Why does this lesion involve the lumbosacral disk and not the other intervertebral disks within the spine? The lumbosacral region of the spine is an area of transition which has resulted since man has acquired the erect posture. Therefore, as in all other regions of radical and more recent change within the phylogenetic development of a species, this area affords a weak place in the function of the body. It also undergoes a radical change in the ontogenetic development of man as the sacrum in the fetus is curved anteriorly, but as growth takes place a posterior rotation occurs with the axis of rotation at the lumbosacral articulation. The rotation is more rapid as the patient becomes ambulatory and assumes the erect posture. It continues until it reaches the position seen in adults, and has rotated through an angle of from 70 to 80 degrees. Practically all of this rotation takes place at the expense of the lumbosacral disk.

This disk is subject to more physiologic trauma than any other within the entire spine. This is due to several reasons. The fact that it is the last disk within the movable spine and therefore supports a heavier load is an important cause. Its safety is further imperiled because the weight supported does not rest squarely on it, as it more nearly does on the lumbar intervertebral disks, but is transmitted to it as a sheering force which tends to slide the fifth lumbar vertebra forward on the first sacral vertebra. The weight expended as a sheering force depends on the acuteness of the lumbosacral angle and therefore varies in different persons.

The security of this disk is further endangered by the fact that it is the bond of union between a fixed first sacral vertebra below and a series of movable vertebrae above. Added to this is the element of motion, which is greater here than at any other level in the dorsal and lumbar spine, except at the lumbodorsal junction in some persons. Anatomic dissections furnish evidence of this fact by revealing a larger joint formed by the intervertebral facets of the fifth lumbar and first sacral vertebrae than at any other site in the dorsolumbar spine. The greater mobility of this joint undoubtedly is due in part to the immobility of the sacrum. The facets are placed obliquely, thus differing from the transverse position in the dorsal region and the sagittal position in the lumbar region, thereby permitting anterior and lateral flexion as well as extension and a moderate amount of rotation.

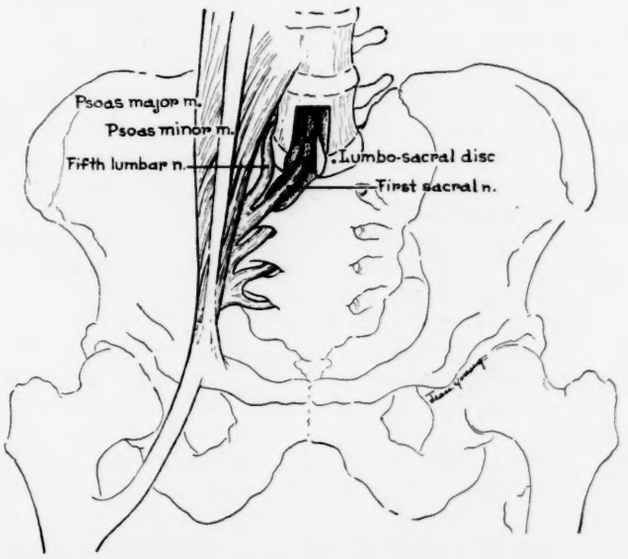

Fig. 7.—Relationship of psoas muscle, fifth lumbar nerve and first sacral nerve to lumbosacral intervertebral disk. (Drawing from anatomic specimen with a section removed from the fifth lumbar and first sacral vertebrae, exposing the neural canal.)

Since the lumbosacral region is an area of transition, congenital anomalies are common. A frequent finding is the asymmetry in the development of the facets. The articular surface of one side may be in a transverse or oblique plane, while the other may be in an anteroposterior plane. This in itself must contribute considerably to the trauma of the part. Most of these facts have been discussed in detail by von Lackum.[2] It is reasonable, therefore, to suppose that such an unusual

2. von Lackum, H. L.: The Lumbosacral Region: An Anatomic Study and Some Clinical Observations, J. A. M. A. **82**: 1109-1114 (April 5) 1924.

amount of continued physiologic trauma to an intrinsically weak lumbosacral region would furnish a favorable site for inflammatory and traumatic diseases.

PROBABLE ETIOLOGY

The cause of the reduced intervertebral space is a question that must be answered by further study. Postmortem studies of this region would undoubtedly afford the most valuable information, but since this is a disease which does not cause death, this form of study is rarely accessible. The following opinions, therefore, have been deduced from the material at hand:

The conditions that might cause a narrowing of an intervertebral joint space are tuberculosis, a congenital anomaly and a functional cessation of the nucleus pulposus.

Tuberculosis of the lumbosacral joint would resemble the lesion I have described in one respect only; i. e., the narrowed joint space. There was no evidence of bone destruction in any of the cases. There was an increased sclerosis around the site rather than the osteoporosis usually seen by the roentgenogram in tuberculosis. The history and clinical course were entirely different from those of a tuberculous patient. All evidence pointed to a nontuberculous etiology.

The possibility that it was a congenital narrowing was considered. If so, one would expect to observe this narrowing in the spinal roentgenograms of persons in early life. This was not the case in the films of nearly three hundred patients whose age limits ranged from infancy to late adolescent life. The youngest patient showing the narrowing was a girl of 17, who injured her back while playing basketball. Severe pain in the lower part of the back, which immediately followed, gradually subsided, but there were repeated exacerbations, and after about four months sciatica developed. This was the only patient under the age of 20. The constant presence of symptoms, the frequent history of injury, the narrowed joint space, the arthritic reaction, which makes its appearance in a few months after onset of symptoms, and the noticeable absence of other congenital anomalies are suggestive of a traumatic lesion and not a congenital narrowing.

The other possibility is a functional cessation of the nucleus pulposus of the lumbosacral intervertebral disk. This structure is a soft gelatinous mass situated approximately in the center of the intervertebral disk and is notochordal in origin. It is ovoid in shape and is continuously under pressure. Its physiology has been well described by Calvé and Galland.[3] It furnishes the intervertebral support of the spine, and when it is ruptured there is an immediate loss of joint space. This has been demonstrated in the laboratory animal by the experimental work of Compere and Keyes.[4]

The nucleus pulposus may be compared to an hydraulic shock absorber. Calvé and Lelievre [5] have shown that it is on the nucleus that movements of the spine can be resisted with elasticity. Thus, its function is one of nullifying the force of strain. Should the strain become too great during violent exercise, such as jumping, bending or lifting, one of two things may occur: There may be a herniation into the bony tissue of the vertebra, as described by Schmorl,[6] or there may be a rupture of the limiting annulus fibrosus, permitting a migration or a complete collapse of the nucleus. In either event, there is loss of the intervertebral joint space, owing to the settling of the vertebrae above, which in turn causes a partial subluxation of the articular facets and a diminution in the diameter of the intervertebral foramina.

The settling of the spine must be considerably greater in the region of the intervertebral foramina and the articular facets following the functional cessation of the nucleus pulposus of the lumbosacral intervertebral disk than it would in a similar accident in the dorsal region. Such an assumption is based on the fact that at the lumbosacral junction the spine presents a lordosis and the center of gravity is located posterior to the vertebral bodies, while the reverse is true in the dorsal region. The transmission of the axial force and pivoting at the lumbosacral junction, which previously had taken place on the nucleus pulposus, must take place on the inelastic posterior superior surface of the first sacral segment.

A partial subluxation of the lumbosacral joint may accompany the settling of the spine; that is, the fifth lumbar segment may go slightly forward on the first sacral segment, suggesting a spondylolisthesis, or it may be displaced slightly backward or to the side. The plane of the articular facets is undoubtedly a factor in determining the direction in which the partial subluxation takes place.

The immediate loss of joint space which follows a rupture of the nucleus is not complete, as the fibers of the annulus fibrosus remain interposed between the two vertebrae. However, as motion continues a pressure atrophy soon results, thus permitting direct contact between the adjacent cortical surfaces of the vertebral bodies. The abnormal stress and motion between these two unprotected bony surfaces result in a scarring and narrowing of the bodies. This furnishes the roentgenologic findings characteristic of a traumatic or hypertrophic arthritis.[4]

It is my opinion that a functional cessation of the nucleus pulposus of the lumbosacral disk (probably a rupture, since we have been unable to demonstrate any perforation of the cartilaginous disk) would afford in detail the clinical and roentgenographic findings presented by this series of cases.

PROBABLE CAUSE OF ROOT PAIN

There are several possible causes of irritation of the nerve root, and one must again resort to theory. The fact that in this series the sciatic pain, as a rule, was preceded by a low back pain suggests the probability that the radiculitis is not caused by the rupture of the nucleus pulposus, but is due rather to a change resulting from the rupture. The cells found in the nucleus are cartilaginous and notochordal in type. When a rupture of the posterior fibers of the annulus fibrosis occurs, the gelatinous content of the nucleus is extruded into the neural canal. Its extrusion is limited, however, by the posterior longitudinal ligament. Occasionally, the cartilaginous cells proliferate, and a definite, indurated, cartilaginous tumor results, which in rare cases may cause pressure on the spinal cord or nerve seg-

3. Calvé, J., and Galland, M.: The Intervertebral Nucleus Pulposus: Its Anatomy, Its Physiology, Its Pathology, J. Bone & Joint Surg. **12**: 555-578 (July) 1930.

4. Compere and Keyes: Personal communication to the author.

5. Calvé, J., and Lelievre, H.: Radiography of the Vertebral Column in Pott's Disease, Am. J. Orthop. Surg. **11**: 193-206 (Oct.) 1913.

6. Schmorl, G.: Ueber die an den Wirbelbandscheiben vorkommenden Ausdehnungs- und Zerreissungsvorgänge und die dadurch an ihnen und der Wirbelspongiosa hervorgerufenen Veränderungen, Verhandl. d. deutsch. path. Gesellsch. **22**: 250, 1927; Ueber Knorpelknötchen an den Wirbelbandscheiben, Fortschr. a. d. Geb. d. Röntgenstrahlen **38**: 265 (Aug.) 1928.

ments, thus producing pressure symptoms. Virchow [7] described such a tumor in 1857 (fig. 8).

As previously stated, with a loss of joint space there is a constriction of the intervertebral foramina. Since the lumbosacral intervertebral foramen is normally smaller than those of the lumbar region, it is probable that its constriction following a rupture of the nucleus, plus the added constriction which must accompany hyperextensive motions of the low spine, may be sufficient to produce compression of the fifth lumbar nerve segment as it emerges from the neural canal (fig. 9).

Another probable source of irritation of the nerve root is the hypertrophic fringe resulting from the abnormal stress between the fifth lumbar and the first sacral vertebra which follows the loss of the joint space. The first sacral nerve segment is in contact posteriorly with the intervertebral disk, while the fifth lumbar segment as it emerges from the canal is in contact with the disk laterally. It is therefore probable that any arthritic reaction involving the inferior surface of the fifth lumbar vertebra or the superior surface of the first sacral vertebra would cause irritation of these segments and provide the clinical picture of sciatica.

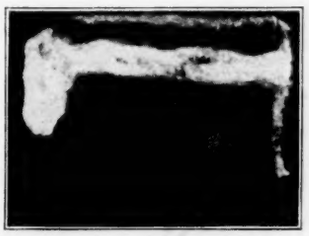

Fig. 8.—Ecchondrosis physalifora: cartilaginous tumor attached to disk and protruding into neural canal.

It is possible that all of these factors, accompanied by inflammation, edema and motion, and the stretching of the capsule of the joint formed by the facets, which must accompany subluxation, play a part in producing the clinical picture described in this series of cases.

TREATMENT

The treatment becomes simplified, as one follows the lead Nature provided. It is well known that most patients suffering with sciatica will, after a period of years, get relief without surgical intervention. Nature attempts to immobilize the part by what is called an arthritic reaction, and if allowed to continue long enough without interference may accomplish a satisfactory fixation and relief from pain.

Figure 4 shows the lumbosacral joint of a man, aged 58, in whom sciatica developed at the age of 31, and persisted at irregular intervals for several years. He has now been free from symptoms for the past ten or fifteen years.

The duty of the surgeon, therefore, is to assist Nature. In furnishing such assistance, he may employ either a conservative or a more radical form of treatment. The conservative treatment consists of immobilization of the lumbosacral joint by means of braces, corsets and plaster, while the more radical treatment is immobilization by a lumbosacral fusion.

Most of the patients in this series were unable to afford hospitalization and were therefore treated with plaster jackets. This was followed, after about ten days, by canvas corsets extending from the middorsal region to the coccyx and reinforced with aluminum strips. About half of the patients so treated, who returned for a check-up, had relief of symptoms. Nine patients who had been incapacitated for months and had received all forms of modern conservative treatment without relief entered the hospital and were placed in plaster spicas extending from the axillae to the toes and to the knee on the unaffected side. There was relief from pain in about forty-eight hours. They remained in the spica for two or three weeks, following which time the plaster was removed and they were fitted with the canvas corset described and instructed in physical therapy in the form of bake and massage to the lower part of the back. All of the patients so treated obtained relief from symptoms and were able to return to work. How permanent the relief will be remains to be seen. It is probable that with a return to strenuous activity and heavy lifting, the symptoms will recur.

There were six patients whom we advised to have a lumbosacral fusion, and four of these consented to this treatment. One, a young woman aged 27, is at the present time up and about, free from pain for the first time in five years. The others were all men who had been incapacitated for from six months to four years; they are now convalescent from the operation.

It is my opinion that the majority of cases of sciatica are due to lumbosacral pathologic changes and that a lumbosacral fusion will afford the desired relief in most cases which fail to respond to conservative methods.

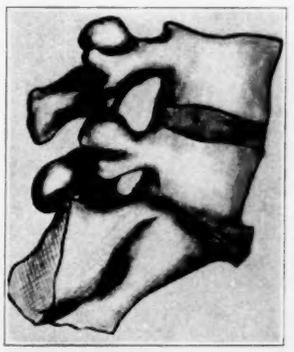

Fig. 9. — Drawing from an x-ray picture, showing loss of lumbosacral disk, arthritic reaction and diminution in diameter of foramina formed by fifth lumbar and first sacral segments as compared to those formed by fourth lumbar and fifth lumbar segments, following a loss of the lumbosacral joint space.

CONCLUSIONS

1. A narrowing or a complete loss of the lumbosacral intervertebral disk with a localized arthritic reaction is found in the majority of cases of sciatica and frequently in cases of "lumbago."

2. Continued physiologic trauma to an intrinsically weak lumbosacral region affords a favorable site for traumatic diseases.

3. A rupture of the nucleus pulposus of the lumbosacral disk would produce the clinical and roentgen findings observed in those cases which showed a reduced lumbosacral joint space.

4. Sciatic irritation is probably due to motion at the lumbosacral joint plus the constriction of the intervertebral foramen and the arthritic lipping which follows the loss of joint space.

5. The treatment indicated is a fixation of the lumbosacral joint.

7. Virchow, R.: Ueber die Entwicklung des Schädelgrundes, Berlin, G. Reimer, 1857. Müller, H.: Ueber das Vorkommen Resten der Chorda dorsalis beim Menschen, Ztschr. f. nat. Med. **2**: 202, 1858. Steiner, H.: Ueber die Ecchondrosis physalifora sphenooccipitalis, Centralbl. f. path. Anat. **5**: 457, 1894. Ribbert, H.: Ueber die experimentelle Erzeugung einer Ecchondrosis physalifora, Verhandl. Cong. f. inn. Med., 1895, pp. 455-464. Goldthwait, Joel E.: The Lumbo-Sacral Articulation: An Explanation of Many Cases of "Lumbago," "Sciatica," and Paraplegia, Boston M. & S. J. **164**: 365-372 (March 9) 1911. O'Reilly, Archer: X-Ray Study of the Lumbosacral Spine, South. M. J. **15**: 217-224 (March) 1922. Kinney, L. C.: Lesions of the Fifth Lumbar Vertebra, Med. & Surg. **1**: 75-78 (March) 1917. Pyle, Edwin: Congenital Abnormalities of the Lumbo-Sacral Region as Causes of Persistent Low Back Pain, New England J. Med. **204**: 1083-1091 (May 21) 1931. Young, J. K.: Roentgen Diagnosis of Lumbosacral Region, Am. J. Orthop. Surg. **14**: 653-656 (Nov.) 1916. Ayers, Charles E.: Lumbo-Sacral Backache, Boston M. & S. J. **196**: 9-16 (Jan. 6) 1927. Putti, V.: New Conceptions in the Pathogenesis of Sciatic Pain, Lancet **2**: 53-60 (July 9) 1927. Hatch, E. S.: Anomalies of the Sacro-Lumbar Articulation, New Orleans M. & S. J. **66**: 119-123 (Aug.) 1913. Nutter, J. A.: Backache and Sciatica of Bone and Joint Origin, Canad. M. A. J. **15**: 1055-1058 (Oct.) 1925. Danforth, M. S., and Wilson, P. D.: The Anatomy of the Lumbo-Sacral Region in Relation to Sciatic Pain, J. Bone & Joint Surg. **7**: 109-160 (Jan.) 1925. Jansen, Hans: Sciatica: Some Recent Scandinavian Investigations on Its Pathogenesis, Lancet **2**: 737-739 (Oct. 1) 1921.

ABSTRACT OF DISCUSSION

DR. FREMONT A. CHANDLER, Chicago: Positive signs, as revealed in the roentgenograms, point toward the pathologic changes in the spine as a source of many of the troublesome cases of sciatica. This is in accord with the observation of orthopedic surgeons in general. The necessity of good roentgenograms of the lumbar spine made in various planes cannot be overemphasized. Too frequently, anteroposterior films alone have been considered sufficient. The anteroposterior view does not show lesions of the disk except in the extreme case. To me, such thinning of the intervertebral disk is evidence of functional failure of the structures of the spine at that level; it is more of an objective sequela of the factors producing nerve irritation than the source of such irritations. Such thinning of the disk must be considered a degenerative change, progressive in nature. The sciatic nerve irritation is not steadily progressive and often entirely clears although the absorption of the disk continues. A similar change of the intervertebral disk between the fifth and sixth cervical vertebrae is found most frequently in arthritis. Here again the nerve irritation fails to coincide with progressive change in the disk. May I inquire as to the fate of the disk substance? Elsewhere in the vertebral column bone defects or cartilaginous deposits suggest herniation. This does not seem to be the case in this series. The treatment employed by Dr. Williams is along the sound natural lines of restoration of stability by rest, external support and, in the resistant cases, by operative fusion.

DR. ARCHER O'REILLY, St. Louis: It is essential in examining and treating backache to have a good lateral view of the spine in the region of the lumbosacral joint. If one does not get a good lateral view one may readily overlook thinning in the disk of this joint. I cannot say much about treatment, but it seems to me, as Dr. Williams has pointed out, that support is desirable. And it would seem that possibly in these cases an early fusion would probably be more desirable than the use of a brace and support.

DR. ALBERT H. BREWSTER, Boston: After reading this paper before coming here, I looked up a number of roentgenograms of people I had been treating for low back pain. I found many of them who had the typical symptoms the author describes who didn't have the narrowing of the disk, and these patients had sufficient lateral roentgenograms to determine that. In a series of other cases, about 25 per cent showed the same symptoms as these patients who had the narrow disk. All orthopedic surgeons treat low back strain and find that many of the patients do not have this narrow disk. Many patients have the hypertrophic change long before one sees any evidence of narrowing of the disk. I should like to ask Dr. Williams how he determines that the nucleus pulposus has been ruptured.

DR. JAMES WARREN SEVER, Boston: Dr. Williams' presentation appealed to me particularly in its relation to the industrial compensation cases in many parts of the country. It has become a real problem to determine whether or not the patient has a backache or sciatica or a sacro-iliac or lumbosacral strain. Years ago everybody was talking bout the sacro-iliac joint and its displacement. Now they are talking about low back pain in the region of the lumbosacral joint. From the point of view of sciatica, of course, it is more logical that the lesion should be there. The sciatica associated with this lumbosacral strain is perfectly definite in the older person who has hypertrophic arthritis. On the other hand, one finds in certain cities that the only possible method of treatment is by operation, early rather than late. As I see these cases in other communities, the treatment in almost identical cases is by traction, in bed, or by a simple corset, the patients perhaps being ambulatory. I think many of them get well quite as fast without surgical intervention as they do with it. It seems to me, particularly in relation to compensation cases, that one should always be on guard about advising operation, because once a person has compensationitis he always has it. It is extremely difficult to get these individuals away from the dole. I do not know what causes the atrophic condition or the thinning of the intervertebral disk, but I think it will be found that in some of the bad cases fusion relieves individuals of pain. One should not get the idea that fusion, particularly in all cases, is the only method of treatment.

DR. HENRY W. MEYERDING, Rochester, Minn.: Failure to recognize this condition occurs principally because good lateral roentgenograms are not taken. If thinning of the intervertebral disk is discovered, one should not conclude that the symptoms must be due to the lumbosacral change alone and that operation should be done, but a complete neurologic examination should be made. One can readily appreciate the calamity that may befall if operation is performed and later a tumor of the spinal cord is discovered. In spondylolisthesis I find changes in the lumbosacral joint such as those described by Dr. Williams; there are narrower lumbosacral joints throughout, narrower posteriorly, narrower anteriorly, with or without hypertrophic changes. I think that the incidence of congenital deformity increases in proportion to the excellence of the roentgenograms. Thus, I started out with a feeling that congenital deformity would be found in 30 per cent of cases of spondylolisthesis, but in forty-nine cases in which excellent lateral views were obtained the incidence jumped up almost to 75 per cent. I am sure that this percentage can be increased further by more careful roentgen examination. I recall Dr. O'Farrell reading his paper on lumbosacral pain about 1923. He realized long ago that many of the so-called sacro-iliac pains were in reality lumbosacral pains. I concur in his opinion. Many of the patients will obtain relief by wearing a broad belt, a corset or a cast. If the symptoms persist, however, and definite pains are present, I am in favor of a fusion operation; but, before fusion is advised, a neurologic examination should be made.

DR. PAUL C. WILLIAMS, Ann Arbor, Mich.: I think the point raised by Drs. Chandler and Brewster in regard to the fate of the disk was a good one. I do not intend to be dogmatic in my theory concerning the fate of the nucleus. This can be determined only by further investigation. Eminent investigators have proved beyond doubt that the nucleus is constantly under pressure and that it furnishes the intervertebral support. This fact was verified in my study by removal of the lumbar spine of a dog immediately following death. It was placed under 40 pounds of pressure and a roentgenogram was taken. The nucleus pulposus was then ruptured by drilling a hole obliquely through the vertebral body until the nucleus was entered. There was a forceful expulsion of the gelatinous content on removal of the drill. A roentgenogram taken immediately, when compared with the previous roentgenogram, showed at least a two-thirds loss of joint space at this site. Therefore, since the nucleus is the intervertebral support, there must be a disturbance of it when a loss of joint space takes place. What this disturbance is I do not know. It may well be a degenerative change, as suggested by Dr. Chandler. The nuclei in old persons frequently show such a change. I do not assert that the lesion described is the cause of all low back pain that occurs in attacks. However, I do believe that it is one of the causes, and is one of the principal causes of sciatic irritation. I think the important point which differentiates this group of patients from those who have sciatic irritation due to hypertrophic arthritis is that the symptoms appear at a much earlier age period and that the arthritic reaction involves the lumbosacral joint alone.

Parathyroid Deficiency. — Tetany is the one generally recognized condition produced by marked parathyroid deficiency. It is characterized by marked hypersensibility of both the central and peripheral nervous systems as well as the vegetative nervous system, and of the muscular system as such. This produces spasms of both striped and smooth muscle which may be constant or intermittent, generalized or local, but always tonic in character. When the plasma calcium falls to the level of 6 mg. per 100 cc. this condition may be anticipated. . . . The two important signs of this condition are Trousseau's, which consists of a tetanic spasm of the hand and forearm after a tourniquet is applied to the upper arm, suppressing the circulation in the brachial artery, and Chvostek's, which is produced by percussing the region of the pes anserinum in front of the ear over the hyperexcitable facial nerve. This produces spasms of the facial muscles of that side, varying from a simple combination of the eyelids and corners of the mouth to definite spasm of the entire side of the face.—Timme, Walter: Lectures on Endocrinology, ed. 2, New York, Paul B. Hoeber, Inc., 1932, p. 56.

Clinical Notes, Suggestions and New Instruments

PULSATING EXOPHTHALMOS: TREATMENT BY PARTIAL LIGATION OF INTERNAL CAROTID

J. L. CAMPBELL, M.D., AND J. D. MARTIN, M.D.
ATLANTA, GA.

Since the first description of pulsating exophthalmos by Benjamin Travers in 1809, treatment has been directed along the same general lines; namely, proximal arterial ligation. It was first believed that the condition was confined to the eye, but that opinion was discredited by Guthrie in 1823 when he performed the first autopsy and found it due to an aneurysm of the ophthalmic artery. Even from this date the pulsation was noted to disappear with compression of the common carotid artery, and ligations have been practiced since. At first only the common carotid artery was ligated; but since Murray's [1] description in 1904 the internal carotid has been ligated as frequently as the common carotid. Locke [2] states that the results obtained are the same. Kerr [3] advocates ligating the common carotid.

The use of digital compression of the carotid by de Schweinitz and Holloway, as advocated by Locke,[2] has been of much value in determining the advisability of ligation of the carotid artery, both as an index of the degree of compression required to obliterate the communication and as an incitation of a sufficient development of a collateral circulation to the brain.

Ligature of the superior ophthalmic vein has been practiced but is usually employed when these other procedures have failed. Ligation of the venous outflow from the cavernous sinus to the orbit attempts to remove the exophthalmos and to produce a thrombosis of the aneurysm.

Fig. 1.—Appearance of patient after ligation of right internal carotid artery. There is yet a prominence of the right eye.

In recent years a more conservative plan of treatment has been followed, owing to the high mortality and the dangers of a hemiplegia following ligation of the carotid arteries. Noland [4] reported three cases treated by rest in bed and compression of the eyeball, but the patients lost the vision of the affected eye. The loss of an eye is to be preferred to hemiplegia, but it is felt that with proper preoperative preparation these complications can be minimized.

The most common type of pulsating exophthalmos is traumatic in origin but, according to de Schweinitz and Holloway, 22.7 per cent are of spontaneous origin. Tumors and orbital defects are occasionally seen as causes. The aneurysmal fistula usually is a communication between the internal carotid artery and the cavernous sinus, but occasionally the opening has been reported to occur between the ophthalmic artery and the sinus. The latter structures lie in close relationship, and fractures involving the base of the skull can easily rupture them.

REPORT OF CASE

R. M., a Negro, aged 20, was admitted to the Emory University Division of the Grady Hospital in July, 1927, with a proptosis of the right eye and deafness of the right ear. All previous history was negative until eight months before admission, when an icebox lid fell on the back of his head. Immediately following the accident the patient was completely

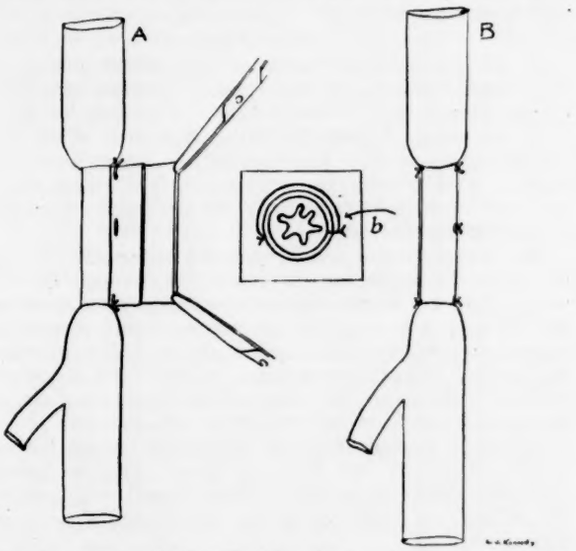

Fig. 2.—*A* and *B*, method of partial occlusion of artery with fascial band; *b*, transverse section of artery (twice the comparative size) with fascial band partially occluding it.

unconscious and a roentgenogram failed to reveal a fracture of the skull. Consciousness was regained at the end of forty-eight hours and it was noted that the eyes were crossed and he complained of a continuous roar in both ears. The vision at this time was double but returned to normal. Three weeks afterward the eyes became straightened, only to be followed by marked prominence of the right eye, which had gradually increased.

A marked prominence of the right eye was noted and it was seen to pulsate synchronously with the heart beat. By gentle pressure the eye was easily replaced, only to be accompanied by increased pulsation. A thrill was felt over the protruded eye and the frontoparietal portion of the skull. A loud bruit was heard over the entire right side of the skull. Ocular movements were normal. The visual fields were normal. There was no central scotoma. Vision in the right eye was 20/40 and in the left eye 20/25. Ophthalmoscopic examination of the right eye showed some congestion of the retinal vessels. Compression over the common carotid artery caused an immediate disappearance of the thrill and bruit and also a drop in the radial pulse rate of six beats per minute. The blood pressure was 110 systolic and 160 diastolic in each arm. The sense of smell was impaired on the right side. Hearing was impaired equally in the two ears. Examination of the ears revealed no abnormalities. The remainder of the cranial nerves were normal.

In the presence of pulsating exophthalmos following trauma and relief of subjective and objective symptoms by compression of the carotid artery, an operation was advised.

July 27, under local anesthesia, a partial ligation of the right internal carotid artery with an autogenous fascial band was done.[5] The band was tightened until the thrill had disappeared, but the lumen of the vessel was not completely occluded. It was estimated that there was 90 per cent closure. Imme-

From the Department of Surgery, Emory University School of Medicine.

1. Murray, F. W.: The Treatment of Pulsating Exophthalmos, Ann. Surg. **39**: 421, 1904.
2. Locke, C. E., Jr.: Intracranial Arteriovenous Aneurysm of Pulsating Exophthalmos, Ann. Surg. **80**: 1 (July), 272 (Aug.) 1924.
3. Kerr, H. H.: Fraction Ligation of Common Carotid Artery in Pulsating Exophthalmos, Surg., Gynec. & Obst. **41**: 565 (Nov.) 1925.
4. Noland, Loyd, and Taylor, A. S.: Pulsating Exophthalmos, the Result of Injury, Tr. South. S. A. **43**: 171, 1930.
5. Campbell, J. L.: Fascial Bands in Treatment of Aneurysm, South. M. J. **19**: 539 (Nov.) 1926.

diate postoperative results were good; a cessation of the thrill and bruit occurred, but no change in the exophthalmos was noted. There were no circulatory disturbances of the brain. The patient was dismissed from the hospital and returned to his occupation as a laborer.

March 20, 1932, he was readmitted to the hospital with a ruptured appendix, and an opportunity was afforded for reexamination. There had been no recurrence of the thrill or bruit over the skull. The right eye was still slightly more prominent than the left. Vision was 20/20 in each eye. The fundi were normal. The visual fields were normal. Tension in both eyes was 17. Branham's sign was negative. No disturbance of the cranial nerves was noted. Hearing was normal and equal in the two ears. Blood Wassermann and Kahn tests were negative.

COMMENT

A case of traumatic pulsating exophthalmos was treated eight months after injury with partial occlusion of the internal carotid artery with a fascial band. The drop of six heart beats per minute following digital compression of the common carotid artery, as first described by Branham,[6] bears out the opinion of this being an arteriovenous communication. The cessation of the pulsation, thrill and bruit after ligation aided in establishing the fact.

The fascial band was used with the expectation of partially occluding the vessel to lessen the flow through the arteriovenous fistula with the hope of producing a thrombosis. At the same time a small amount of blood was reinforcing the collateral circulation and lessening the possibility of anemia of the brain. Digital compression of the carotid artery was utilized to determine the safety of the ligation and the results to be expected from the procedure. Occasionally it may be necessary to proceed further by completely ligating the internal carotid artery, as was done by Kerr,[3] when he ligated the common carotid artery with chromic catgut and then severed the artery so there would be no reestablishment of the circulation.

It has now been five years following the partial occlusion in this case and there has been no recurrence of thrill, bruit or pulsation.

ACUTE GANGRENOUS APPENDIX EPIPLOICA

H. E. RANDALL, M.D., FLINT, MICH.

Two recent reports of the rarer abdominal conditions prompt a report of a case of gangrenous appendix epiploica, simulating acute appendicitis, in the left iliac region.

Max and Philip Thorek [1] reported a case of epiploitis with abscess occurring two months after an operation for hernia. "In postoperative epiploitis two types are mentioned, one chronic, the other acute, of embolic or thrombotic origin."

G. H. Colt [2] reported three cases of appendices epiploicae and says that Johanssen in 1927 collected reports of twenty cases from the literature. Localized pain and tenderness with nausea or vomiting would suggest the possibility of a torsion of an appendix epiploica. In the case to be reported there was no twist of the pedicle and hence the condition was of embolic or thrombotic origin.

REPORT OF CASE

A. B. L., a man, was apparently in good health until two days before I saw him, when he began to have continuous dull pain in the lower left quadrant of the abdomen. The next day, because of a feeling of distention, he took a bottle of magnesium citrate, without relief from pain. Movement caused an attack of sharp pain in this region. On one occasion he felt nauseated. There were no urinary symptoms. His general health had always been good. General physical examination was negative except for general tympanites throughout the abdomen. There was tenderness in the center of a line drawn from the umbilicus to the middle of the left Poupart ligament. There was a sausage-shaped mass in this region. The urine was normal. The leukocyte count was 12,500, with polymorphonuclears 68 per cent and lymphocytes 32 per cent. The diagnosis lay among three possibilities: an involved Meckel diverticulum, a diverticulum of the sigmoid, or a transposed appendix. Dec. 26, 1931, an incision was made through the lower left rectus muscle, a black mass 2 inches long and 1 inch wide was removed, and several other appendices epiploicae were removed. There was no twist of the pedicle of this black gangrenous mass, hence the cause must have been embolic or thrombotic. There had been no previous symptoms, and none have occurred since the operation.

6. Branham, H. M.: Aneurysmal Varix of the Femoral Artery and Vein Following a Gunshot Wound, Internat. J. Surg. **3**: 250 (Nov.) 1980.

1. Thorek, Max, and Thorek, Philip: Postoperative Epiploitis with Abscess, J. A. M. A. **98**: 1548 (April 30) 1932.

2. Colt, G. H.: Three Cases of Torsion of an Appendix Epiploica of the Sigmoid Colon, Brit. J. Surg. **19**: 508 (Jan.) 1932.

GONOCOCCEMIA WITH RECOVERY

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Recovery in a proved case of gonococcal bacteremia is of sufficient rarity to warrant recording. A great number of such bacteremias occur unnoticed because of the intermittent character of the disease and the difficulty in obtaining cultures of the organism. The majority of recognized cases are fatal; the few patients who recovered had cardiac lesions. Recently, Wheeler and Cornell [1] and Garlock [2] reported cases of gonococcal bacteremia in women with cures by surgical intervention. A description of a gonococcemia in a woman with recovery is detailed because of the onset of specific bacteremia during hospitalization, and recovery without demonstrable endocardial localization or institution of focal surgery:

REPORT OF CASE

E. G., a woman, aged 21, a bookkeeper, admitted to the hospital, May 5, 1931, had been forced to bed, five weeks previously, by painful joints, malaise and fever. The joints affected were the left shoulder, the left ankle, the sternoclavicular, the phalangeal, and the right wrist. The latter had become progressively worse and, at the time of admission, was the only joint involved. There had been no chills and no cardiac, respiratory or gastro-intestinal complaints. The past and family histories were irrelevant. The patient at first stated that she was not married but later admitted a secret marriage of three months' duration.

She was admitted with a temperature of 100 F., pulse 100, respiration 22, and blood pressure 98 systolic, 58 diastolic. The patient was well nourished. She anxiously guarded her right wrist. The tonsils were diseased. There were no pulmonary, cardiac or abdominal abnormalities noted. The skin was clear. The right wrist was swollen and exquisitely tender, the slightest movement eliciting intense pain. Pelvic examination was not permitted.

The preliminary diagnosis was rheumatic fever, with infectious arthritis to be definitely ruled out.

During the next few days the clinical picture remained the same. Urinalysis was negative. Blood count demonstrated 80 per cent hemoglobin, 4,510,000 erythrocytes, and 12,300 leukocytes with 77 per cent polymorphonuclear cells. The Wassermann reaction (Kolmer), the Kahn test, and gonococcus complement fixation were negative. Chemical examination of the blood gave normal results. Blood culture was sterile. The electrocardiogram was normal. Roentgenograms demonstrated a normal chest and heart, and a destructive arthritis of the right wrist joint. The latter indicated the presence of an infectious arthritis, and a search for possible foci was made. The patient was extremely uncooperative, refusing local throat treatment and vaginal examination. Treatment included massive doses of sodium salicylate, occasional hypodermics of morphine for pain, guaiacol-glycerin solution locally to the wrist, and daily intravenous injections of Pregl's solution of iodine. After four days she could tolerate no more salicylate orally and it was given rectally. The persistence of severe wrist pain, in

From the Medical Service of the Mount Sinai Hospital.

1. Wheeler, G. W., and Cornell, N. W.: Gonococcal Bacteremia in a Woman with Apparent Cure by Surgical Intervention, J. A. M. A. **94**: 1568 (May 17) 1930.

2. Garlock, J. C.: Gonococcal Bacteremia in a Woman with Cure by Surgical Intervention, J. A. M. A. **97**: 999 (Oct. 3) 1931.

spite of large doses of salicylate, favored a diagnosis of a nonrheumatic arthritis.

May 11 (six days after admission), she had a chill, the temperature rising to 102.4, accompanied by a leukocytosis of 22,300 with 90 per cent polymorphonuclear cells and no change on physical examination. Another blood culture was obtained just after the chill. The next day, a maculopapular eruption appeared on the limbs and trunk, and the temperature remained elevated. Cultures of several of the skin lesions were sterile. The temperature had slight remissions for a few days, then receded, and the eruption gradually faded. During the brief febrile period, a soft systolic murmur was audible over the precordium. There was no further recurrence of the chill, elevation of temperature, eruption or murmur. The blood culture, taken after the chill, was reported as follows: "After forty-eight hours, the bedside plates averaged 44 colonies per plate. The colonies were gray, mucoid, and semianaerobic. On staining, the organism was a definite gram-negative diplococcus. It fermented only dextrose and not levulose, maltose or sucrose. This is unquestionably a gonococcus."

May 13, the patient received a blood transfusion of 350 cc. May 14, a cast was applied to the right wrist. The temperature was normal and the wrist pain considerably less. May 18, injections of gonococcus vaccine were instituted (beginning with 300 million organisms and increasing by 300 million every other day). Within eighteen hours after each of the first few vaccine injections, the patient complained bitterly of pain in the immobilized wrist and a slight febrile reaction occurred. May 21, the patient finally permitted a vaginal examination, and gonococci were found on a smear obtained from the cervical canal, although no clinical signs of cervical infection were present. Local therapy was given in the form of heat and douching.

May 29, after twenty-four days of hospitalization, the patient was discharged. She appeared at irregular intervals in the orthopedic outpatient department for care of the wrist joint, which became ankylosed within two months. She refused to report for physical therapeutics or gynecologic follow up. She was seen eight months later. There had been no further recurrences of fever, joint symptoms, or chills. The wrist joint was immobile and painless, and no evidences of a cardiac lesion were noted. The gonococcus complement fixation test was found positive.

COMMENT

The positive blood culture, the embolic rash, the recovery without a cardiac lesion, the delayed complement fixation reaction, and the therapy employed (vaccine, Pregl's solution of iodine, cast, vaginal douching, and salicylates) are all worthy of mention.

Wertheim gave the first probable demonstration of blood invasion by the gonococcus in 1890; but Hewes, in 1894, actually recovered the organism from a blood culture. Since then reports of gonococcemias have been many, especially by Thayer and Blumer, Cole, Faure-Beaulieu, Silverstrini, Dielafoy, Gibbs, Loforo, Watson, Dwyer, Wilson, Jenkins, Tebbutt, Goldstein, Withington, Pepper, Kramer and Smith, Berner, Marfan and Debre, Jausion, O'Brien and Bancker, Riecker, Tapie and Riser, Rossoni, Cabot, Schaeffer and Baron, Sheppard, Wheeler and Cornell, and Garlock.

The onset of bacteremia was noted by a chill, rise in temperature, malaise, and (within twenty-four hours) a maculopapular eruption. Although Pregl's solution of iodine was administered, we feel that this was not an iodide reaction but rather the embolic rash of gonococcemia as previously described by other authors (Cabot,[3] Wilson, Jenkins,[4] Wheeler and Cornell, Garlock, Blumer,[5] and O'Brien and Bancker[6]). It resembles the rash of German measles most clearly but may be urticarial or resemble rose spots. It is usually more prominent on the trunk and extremities, and it fades slowly in two or three days. The eruption itself causes no discomfort, although occasional lesions become furuncular. No organisms can be recovered from the individual skin lesions, as is usually the case with metastatic eruptions.

An innumerable number of cases of gonococcemia must go on to recovery unrecognized. Formerly they were looked on as certain fatalities in view of the high percentage of endocardial involvement. Thayer[7] reviewed thirty postmortem records of gonococcemias at the Johns Hopkins Hospital and each one presented ulcerative or vegetative endocarditis. In Wheeler and Cornell's series, four of the five patients who died of gonococcemia had endocardial disease. In 1928, O'Brien and Bancker, reporting a recovery without a resultant cardiac lesion, were unable to find any reference to a similar case. However, Jenkins in 1922 and Cabot in 1927 had each cited a recovery without apparent cardiac damage. Wheeler and Cornell, and Garlock, have since reported two cases. The total of recovered cases without cardiac lesions, including the present report, is six (Jenkins, Cabot, O'Brien and Bancker, Wheeler and Cornell, Garlock, and our case). A transient, soft systolic murmur was audible at the apex during the bacteremia. Such a murmur was also noted by Garlock and by O'Brien and Bancker. Gourvich emphasized the frequency of a systolic murmur, audible at the height of the bacteremia but disappearing later. It is likely, as O'Brien and Bancker suggest, that this transient murmur may be caused by edema of the valves. Cabot believes that the valves must be previously damaged, as a background, for a real gonococcal endocarditis to ensue.

The facts relative to the gonococcus complement fixation test are interesting. During the gonococcemia and immediately afterward, the reaction was negative; but several months later it was positive. This observation is in accord with the work of Pepper,[8] who noted positive reactions months after the original infection. The test is not infallible and ought not to be the sole criterion of a diagnosis. In Pepper's series of arthritis cases, positive reactions developed in less than half, and three remained negative in spite of actual isolation of gonococci from the joints. Nevertheless, a positive reaction strengthens the diagnosis. Whether or not our patient would have developed immune bodies sufficient to give a positive fixation test without the auxiliary vaccine injections is problematic.

In the absence of specific serums, the problem of managing a positive blood culture is largely vested in measures to raise the body defenses. In our case these consisted of a single blood transfusion, subcutaneous injections of gonococcus vaccine, intravenous injections of Pregl's solution of iodine, and vaginal douching. As the evidences of bacteremia subsided within forty-eight hours, we feel that it might have occurred without any medical aid. No repetition of the bacteremia occurred, and we supposed that whatever focus existed in the cervix had been eradicated. On the other hand, had we obtained a series of intermitting positive and negative blood cultures, as described by Wheeler and Cornell and by Garlock, cervical cauterization or amputation would have been considered.

The rationale of using Pregl's solution of iodine intravenously is still a question; it has many enthusiastic supporters and an equal number of others who feel that it offers no beneficial results. Our experiences lead us to believe that, although it has no specific influence in bacteremias, it is an augmentary therapeutic measure. Gonococcus vaccine injections were employed with the same object in mind. In agreement with the work of Irons,[9] vaccine was certainly of diagnostic value. On institution of vaccine therapy a definite "negative phase" followed each injection within twenty-four hours, recognized by increased joint pains, rise in temperature, and malaise. This provocative reaction occurred regularly with each of the first few injections. Irons administered gonococcus vaccine to eight normal individuals and in forty cases of gonorrheal arthritis and no reaction was obtained in the normal persons. With such positive evidence of the specificity of the vaccine, one is inclined to favor it as a therapeutic agent.

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3. Cabot, H. C.: Bacteremia, Urethritis and Arthritis? Boston M. & S. J. **197**: 1140 (Dec. 15) 1927.
4. Jenkins, J. A.: Gonococcal Septicemia, Brit. M. J. **1**: 641 (April 29) 1922.
5. Blumer, George: Gonorrhea, in the Oxford System of Medicine, vol. 5.
6. O'Brien, T. J., and Bancker, E. A., Jr.: Gonococcus Septicemia Recovery Without a Cardiac Complication, New England J. Med. **198**: 184 (March 15) 1928.
7. Thayer, W. S.: On the Cardiac Complications of Gonorrhea, Bull. Johns Hopkins Hosp. **33**: 361 (Oct.) 1922.
8. Pepper, O. H. P.: Diagnosis of Gonococcus Arthritis, Ann. Int. Med. **3**: 328 (Oct.) 1929.
9. Irons, E. E.: The Treatment of Gonococcic Arthritis by Injections of Dead Gonococci, and the Clinical Reaction Which Follows the Injection, Arch. Int. Med. **1**: 433 (May) 1908.

ULTIMATE RESULTS OF THYROIDECTOMY

ANALYSIS OF ONE HUNDRED CONSECUTIVE CASES TWO YEARS AFTER OPERATION

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From the Buffalo Thyroid Clinic

Some time ago I[1] published the results of one hundred consecutive thyroidectomies three months after operation. All cases were included, in order to make the selection entirely impersonal. The same principle was used in the examination, the study being based on purely objective tests; namely, the pulse, the weight, and the basal metabolism. In addition to these, the patients' own statements as to their nervousness and general state of health were taken into consideration because no patient is cured unless she herself feels satisfied with her condition.

In summing up my observations at that time, I concluded that:

"1. In a series of 100 consecutive thyroidectomies, representing 108 operations, examined three months after operation, 93 per cent of the patients report either satisfactory improvement or complete cure.

"2. Eighty-seven per cent showed a reduction or continuation of a normal pulse rate.

"3. Eighty-nine per cent either gained weight or continued a normal weight.

"4. Eighty-four per cent showed either a reduction or a continuance of a normal basal metabolic rate.

"5. Taking all factors into consideration, we would place the percentage of cures three months after thyroidectomy between 80 and 90 per cent.

"6. With an operative mortality of 1 per cent and a cure of 80 to 90 per cent in three months, thyroidectomy seems to offer the best chance of cure in most cases of goiter."

Two years later I again investigated the condition of the same patients. Two years seemed to be sufficient time for the results of thyroidectomy to have become permanent and for residual hyperthyroidism and recurrences to have become evident.

I succeeded in personally examining sixty patients and getting reliable information of twenty-two more, a total of eighty-two.

Five of these had died, one operative death, one from hyperthyroidism three and one-half months after a unilateral thyroidectomy, and three from causes not connected with the thyroid. One had gone to Europe, where she had gone through a successful pregnancy.

Of the remaining seventy-six, the pulse had decreased or continued normal in seventy-two and increased in four, a percentage of 94.75; seventy had gained or continued a normal weight, while four had lost weight, a percentage of 94.5; the basal metabolism had come down or continued normal in forty-seven and increased in two, a percentage of 95.75, the highest being +25 and the lowest −13; seventy-two reported that their nervousness was less and that they were perfectly satisfied and feeling good, while four still complained of symptoms, a percentage of 94.75.

In regard to the last item, mere figures do not express the extreme satisfaction and gratitude of these patients. It was a most pleasant experience to examine seventy-six patients after two years and find seventy-two perfectly satisfied.

With careful preoperative examination and preparation of patients, including the use of iodine, the carrying out of the operative procedure by qualified teams, and the skilled supervision of the postoperative treatment, the mortality of thyroidectomy now is so low (in this series 1 per cent), that the only question that remains is Which form of treatment, medical, radiation or surgical, gives the most complete and permanent cure?

This question can be answered only by an unprejudiced and complete study of series of cases several years after various forms of treatment have been completed. Not many such studies have been reported and some of those reported have been incomplete, using as a criterion only one test, such as the basal metabolism, or the patient's own report of her condition.

Until this is done and shows better results from other than surgical treatment of goiter, when surgical treatment is indicated, and as a result of my experience in the surgical treatment of goiter, especially as shown by the intensive study of one hundred consecutive cases, I feel justified in the following conclusions:

1. In a series of one hundred consecutive thyroidectomies, 94.75 per cent of seventy-six patients examined after two years report a completely satisfactory improvement or cure.

2. This is verified by three objective tests:

   (*a*) The pulse was decreased or continued normal in 94.75 per cent of seventy-six patients.

   (*b*) The weight was increased or continued normal in 94.5 per cent of seventy-four patients.

   (*c*) The basal metabolic rate was decreased or continued normal in 95.75 per cent of forty-nine patients.

3. Allowing for the eighteen cases I was unable to reach in the study and for the death under medical treatment three and one-half months after a unilateral thyroidectomy, I would place the proportion of cures after two years, and therefore probably permanent, at 90 per cent.

4. With an operative mortality of 1 per cent and a cure of 90 per cent, thyroidectomy still seems to offer the best chance of cure in most cases of goiter.

3 Linwood Avenue.

1. Noehren, A. H.: Results of Thyroidectomy: Analysis of One Hundred Cases, Ann. Surg. **93**: 1045-1049 (May) 1931.

A RAPID AND MORE ACCURATE METHOD OF DETERMINING THE POLLEN CONTENT OF THE AIR

WILLIAM W. DUKE, M.D., KANSAS CITY, MO.

A daily analysis of the air for pollen is of great assistance to physicians treating allergy. The method of analysis commonly used consists of placing a greasy slide in the outside air for a period of twenty-four hours and counting the number of pollen granules deposited on a given unit of surface. Durham, who has done the most extensive work in this line, counts the number of granules deposited on 1.8 square centimeters of surface as a standard and assumes with Scheppegrell and others that this represents the pollen content of a cubic yard of air. The area 1.8 square centimeters can be counted by crossing a slide five times from side to side with a low power microscope so adjusted as to cover a field 1.4 mm. wide.

This method of analysis is very useful because of its simplicity. The limit of error, however, is gross and would make the method valueless were it not for the equally gross variation in the pollen content of the air at different times. The pollen content of the air may actually vary within a week from almost nil to 2,000 or more per cubic yard of air. Consequently almost any method of analysis, regardless of error, gives useful information which a physician can employ in clinical work.

The source of error in the "gravity" method of analysis lies in the variation in the velocity of air currents that reach the slide. Accuracy of the gravity method depends on the dropping down of pollen granules from still air on a sticky surface. Air motion increases the amount deposited to such an extent that slides placed simultaneously on the roof of a tall building and in a window sill to the lee of the building may show a difference in the count of as much as 600 per cent in favor of the slide exposed to the wind.

This method of counting has been modified by Penfound and Efron through placing a slide on a weather vane in such a position as to be constantly struck at a maximum force by wind. This method of exposure exaggerates the factor due to wind velocity and eliminates the factor due to a gravity fall of the pollen granules. In an effort to make exposures to still outside air, I have tried placing slides in various shaped receptacles and in various positions in relation to wind obstruction. Hundreds of counts made in this way were so variable and contradictory as to look ridiculous and need not be reported.

In an effort to eliminate the variableness of the air current factor and with a willingness to give up the gravity fall factor, I devised a blower, shown in figure 1, which delivers air to a greasy slide at a constant rate of speed—in fact, at such a speed that both the gravity factor and the wind factor become incon-

sequential. This blower sucks in air from above and delivers it at its mouth at a rate as determined by an anemometer of about 40 miles an hour if attached to a direct current and 35 miles an hour if attached to an indirect current. If a greasy slide is so exposed at the mouth of the blower on its holder at an angle of 45 degrees, pollen is deposited at a relatively uniform rate. The blower should be placed in such a position as to be sheltered from the wind and not exposed to pollen showers blown up from the surface of the floor near which the exposure is made.

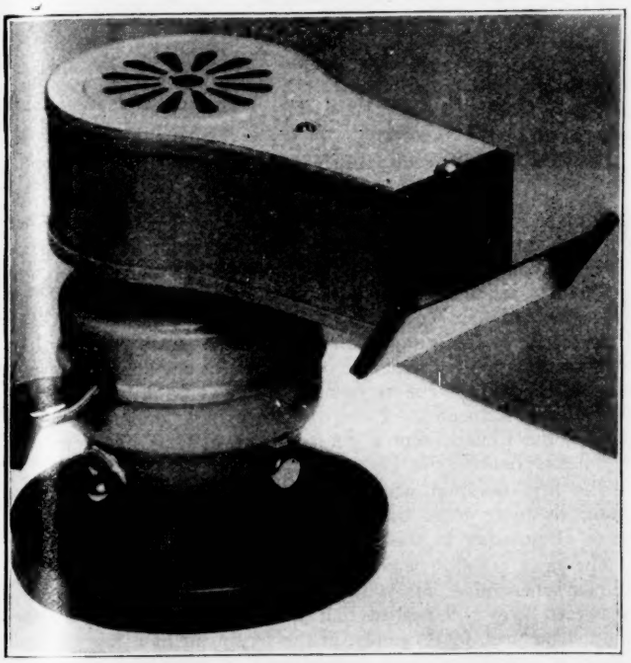

Fig. 1.—Blower for use in estimating the pollen content of the air. The instrument blows air against a greasy slide placed in the holder at a rate of about 40 miles an hour. The number of pollen granules deposited on 1.8 square centimeters of surface and multiplied by 2 or 3 approximates very crudely the content of a cubic yard of air. This method of estimation, though only relatively accurate, is very useful for clinical purposes.

The larger amount of pollen is deposited on the upper areas of the slide, owing probably in part to the greater rate of wind in this area and in part to the fact that pollen granules deposited at the lower side of the slide might be blown upward. Since counts are made by passing across the slide five times from side to side, this source of error is of no great consequence.

TABLE 1.—*Variation in Counts Made by Wind*

	Count
24 hour outside count (gravity)	1,566
2 hour horizontal slide exposure (wind rate 15 miles per hour) multiplied by 12	2,448
5 minute blower slide exposed simultaneously multiplied by 2	1,624
2 hour slide lying in sheltered position (multiplied by 12)	1,116
5 minute slide made simultaneously multiplied by 2	1,104

Figure 2 shows two graphs, one representing twenty-four hour exposures on the roof of a tall building from the outside air, the other from slides exposed five minutes to the blower and multiplied by two. The five minute blower counts multiplied by two are below the twenty-four hour natural exposures. I cannot at the present time give figures by which blower values and natural gravity values can be compared accurately because of the difficulty encountered in obtaining gravity values from still outside air. It is believed that five minute blower counts multiplied by two or three would approximate twenty-four hour gravity counts if they could be made from still air having a constant pollen concentration. It would therefore approximate very roughly the content of a cubic yard of air.

The difference between blower and gravity counts is exaggerated on windy days. The difference that the wind makes is shown by the typical counts in table 1.

A distinct advantage in the blower method lies in the fact that air can be analyzed quickly on a given day and in many different places. It does not represent the twenty-four hour mean, however, that is obtained by the gravity method and which possibly means more to the patient. On a windy day, counts were obtained in various rooms in my office in all but one of which there was a distinct draft (table 2). They serve as typical examples. It must be mentioned, however, that outside determinations made at intervals of ten minutes or more frequently show a difference of from 50 to 100 per cent. Technical accuracy cannot be counted on to an extent of less than 50 per cent.

SUMMARY

A method of air analysis for pollen and similar substances is here described which can be made within a period of minutes and which is much more accurate than the twenty-four hour gravity method which is now used. It does not represent a mean value for twenty-four hours, however, and therefore gives a result which may be quite different from twenty-four hour gravity estimates.

The blower method of analysis eliminates the wind factor, which under certain circumstances may be a source of a 600 per cent error in the gravity method.

Duplicate estimations carried out repeatedly show that blower estimations, as here described, can be made within a limit of error of less than 100 per cent. This is accurate enough for clinical purposes.

820 Professional Building.

TABLE 2.—*Counts of Pollen Granules Determined in Various Rooms*

Room	Count
24 hour gravity count, outside air—15 mile wind during day	2,034
5 minute blower count multiplied by 2, outside air, sheltered position	104
5 minute blower count, multiplied by 2, inside reception room	72
5 minute blower count, multiplied by 2, inside x-ray room	96
5 minute blower count, multiplied by 2, inside room without ventilation except from one open door	28
5 minute blower count, multiplied by 2, outside private office with windward windows closed, door frequently opened but almost no draft	12

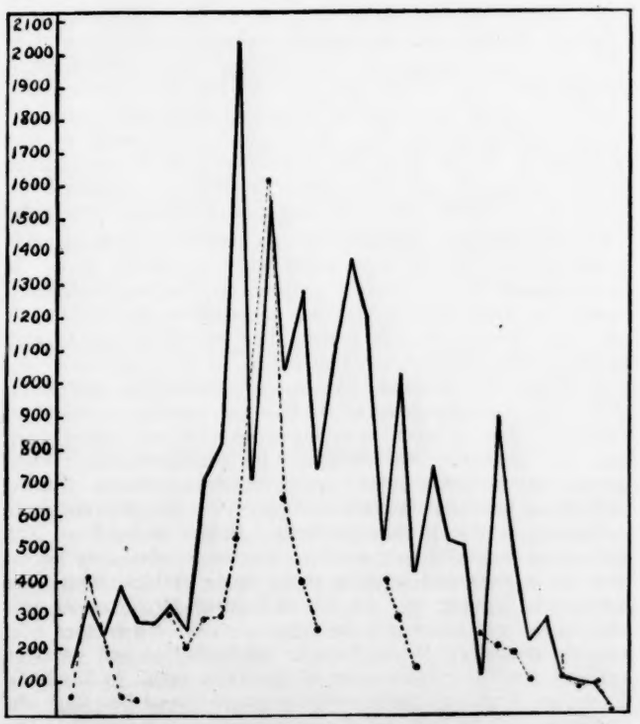

Fig. 2.—A comparison of twenty-four hours' gravity slide ragweed pollen counts with five minute blower counts multiplied by 2. The counts were not all made on consecutive days. The blower counts are indicated by the dotted line and the gravity counts by the heavy line.

Council on Pharmacy and Chemistry

THE COUNCIL HAS UNANIMOUSLY ADOPTED THE FOLLOWING REPORT OF THE COMMITTEE ON RESOLUTIONS ON THE DEATH OF WILLIAM AUGUST PUCKNER.

P. N. LEECH, Acting Secretary.

WILLIAM AUGUST PUCKNER

William August Puckner was born, Feb. 24, 1864, at New Holstein, Wis. He died in the Presbyterian Hospital, Chicago, Oct. 1, 1932. He had been in failing health for a long time and in the hospital some ten weeks.

The creation of the Council on Pharmacy and Chemistry was authorized by the Board of Trustees of the American Medical Association, Feb. 3, 1905; the first meeting of the newly created Council was held at Pittsburgh some ten days later. Professor Puckner, one of the original members, attended that meeting and was active in formulating the principles on which the Council has worked, as expressed in its official rules of procedure. One year later he became Secretary, a position of grave responsibility; he filled it well and faithfully for twenty-six years and seven months.

Professor Puckner was well equipped for the position he had assumed. A graduate of the Chicago College of Pharmacy, now the Illinois School of Pharmacy, he later became professor of chemistry in that school. He took a course of chemistry at Harvard University and later studied at the University of Heidelberg. He received the honorary degrees of Doctor of Pharmacy, from the University of Pittsburgh, and Master of Pharmacy, from the Philadelphia School of Science. Dr. Puckner was an outstanding chemist and at the time of his appointment as Secretary of the Council he had already won for himself an enviable reputation in the field of alkaloidal chemistry. He was a charter member of the Chicago Section of the American Chemical Society and was elected chairman of that section in 1895. For some years Dr. Puckner was chief chemist for a pharmaceutic firm—Searle and Hereth—and this, added to his experience as professor in the school of pharmacy, gave him an intimate knowledge, from every angle, of the work he was undertaking. On accepting the secretaryship he, of course, gave up his connection with this firm. In 1907 he organized the A. M. A. Chemical Laboratory and was its director until 1924.

Dr. Puckner was endowed with an especially good memory, which possibly became more acute when he became blind. If he was asked about a product that had been before the Council months or years before, without referring to the bulletin or any other records, it was seldom that he was unable to give in detail every action taken that led to its acceptance or rejection. Under his direction, the weekly bulletin—the medium by which the Council transacts its business—became a model of efficiency. But of much more importance in this council work was his personality, his attributes, his characteristics. While occasionally he had to meet, personally, representatives of firms submitting products, he preferred wherever possible the more deliberate practice of correspondence. In this he exhibited tact, patience, resourcefulness, qualities that were absolutely necessary for a successful solution of the many problems that were continually coming up. In all such cases Dr. Puckner was able to see and appreciate the point of view of the other side, the manufacturer. When his eyes began failing and when he realized that the condition would inevitably result in blindness, Professor Puckner courageously prepared himself to face the handicap. He investigated the practicability of Braille's system for the blind and the typewriter; both of these he used. He kept in touch with current medical and chemical literature, both English and foreign, especially German, by having matter read to him, and in the case of important articles, recorded on the dictaphone for review at home; for his determination to overcome this disability compelled him to work night as well as day.

To those who knew him at his daily work, Dr. Puckner seemed to have dedicated his life to that which seemed nearest to his heart—the success of the Council and its efforts to advance scientific therapeutics. With patience in adversity, with sincerity of purpose, with conscientious devotion, he carried on. His heart was in his work; his life, devoted to the cause he served.

The Council, individually and collectively, wishes to express its high regard and affection for Dr. Puckner as a friend and co-worker and admiration for the way he carried on, for his executive ability, for his efficiency in spite of handicap, for his loyalty.

In his death, the Council has lost a member of unique value: the medical profession, a servant who, unobtrusively, served it faithfully for a quarter of a century.

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

SULPHARSPHENAMINE: ITS USES AND LIMITATIONS

For some years the Council has considered the question of the high incidence of untoward reactions from sulpharsphenamine as compared with other arsphenamines. In 1925 a paragraph of warning was included in the description of the drug appearing in the current edition of New and Nonofficial Remedies. Recently question was raised as to whether, in view of the admitted danger from the use of sulpharsphenamine, it should no longer be recognized by description in New and Nonofficial Remedies. In order to obtain guidance in the matter, the Council sent a questionnaire to sixty-one dermatosyphilographers in the United States.

The first question was: "1. Do you regard sulpharsphenamine as more toxic than the other arsphenamines?" There were 51 answers to this: 42 "yes," and 9 "no."

The next question was: "2. Are you continuing the use of sulpharsphenamine in your clinic?" There were 16 who answered "yes"; 9 replied that they were using it in a very limited manner, for example, in the treatment of a few isolated cases of heredosyphilis. There were 27 who answered "no."

To the third question, "Do you believe that the Council on Pharmacy and Chemistry would be justified in withdrawing this preparation from further recognition in New and Nonofficial Remedies, because of its greater tendency to dangerous toxic reactions?" 28 answered "yes," 2 gave a questionable answer, and 22 answered "no."

The following are selected comments from those who are unfavorable to the use of sulpharsphenamine:

Dr. Joseph V. Klauder, Philadelphia: "Following my experiences as published in 'Hypersensitiveness to Local Contact with the Arsphenamines Producing Chronic Eczematoid Dermatitis and Asthmatic Symptoms' (*Arch. Dermat. & Syph.* **5**:486 [April] 1922) I have never advocated intramuscular injections of an arsenical preparation. I have therefore employed sulpharsphenamine very little and cannot record reactions from its use.

"The work notably of Frei and Sulzberger, in which it was possible to sensitize guinea-pigs by subcutaneous injections of an arsenical, is in line with the views I expressed in the aforementioned paper. This laboratory evidence, together with clinical evidence, in the direction of showing that sulpharsphenamine produces a greater incidence of untoward reactions, justifies one in not advocating its use."

Dr. Joseph Earle Moore, Baltimore: "This drug is apparently better tolerated by infants than by adults, and dermatitis, blood dyscrasias and encephalitis are not reported among them with the same frequency as in adults. Nevertheless, I feel that if the drug remains in N. N. R. as available for use in infants, it will still be used in larger quantities in adults, with disastrous results."

Dr. John H. Stokes, Philadelphia: "I have had a considerable experience with sulpharsphenamine, being, in fact, the first extensive user of the product in this country.

"I think there is no reasonable doubt of the relatively high therapeutic effectiveness of sulpharsphenamine when used intramuscularly. Given intravenously, I believe it has no special advantages. With reference to the matter of reactions, however, there is not a doubt in my mind that the drug is probably the most toxic arsphenamine now available and that its high toxicity is by no means compensated for by its slightly superior

therapeutic qualities as referred to neoarsphenamine, for example, as a base.

"I may say that I had never seen a hemorrhagic aplastic reaction to an arsphenamine in an experience numbering more than a hundred thousand injections, until I began to use sulpharsphenamine. Then, like a thunder clap, within a short period of several months I saw five cases in rapid succession, all due to this drug (sulpharsphenamine). While, of course, these reactions do occur, particularly under the sulphoxalate arsphenamines, they are and should be exceedingly rare.

"The incidence of exfoliative dermatitis under sulpharsphenamine is, in my experience, at least five times that of the same complication under neoarsphenamine. These considerations led me, following a fatality which constituted the sixth example of hemorrhagic reaction that I had seen due to this drug within a comparatively small series of injections, to abandon its use entirely and I have not hesitated to condemn it since, whenever occasion arose. While I believe children to be decidedly more tolerant of the drug than adults and believe therefore that it sometimes serves a useful purpose in treating prenatal syphilis, I believe that it can be now regarded as practically replaced by bismuth and bismuth arsphenamine sulphonate in this field, to say nothing of the previous relatively satisfactory technic employing neoarsphenamine. I feel, therefore, that sulpharsphenamine as such no longer has a field in medical practice and I am heartily glad to see that the Council on Pharmacy and Chemistry contemplates its withdrawal from their recognized list. I have authorized the continuance of the drug at the children's clinic of one of my services, where it was in use before we took charge, in order to complete a series. It seems to give little trouble there, but in adults I am thoroughly afraid of it."

Dr. Richard S. Weiss, St. Louis: "Have completely discarded this drug, not only on account of reactions but also on account of poor therapeutic results."

Dr. F. W. Cregor, Indianapolis: "I am glad to note the interest of the Council and feel that sulpharsphenamine has in the past received a distinction that was not justified."

Dr. Charles C. Dennie, Kansas City, Mo.: "Sulpharsphenamine should never have been admitted in the first place. It was one of the earliest compounds made by Ehrlich and discarded by him. The only excuse for its manufacture was the fact that it could be given intramuscularly."

Dr. C. Morton Smith, Boston: "It would work no hardship to me in my practice if sulpharsphenamine was withdrawn, and I should be perfectly willing to abide by your decision from the evidence obtained from the physicians throughout the country. I am inclined to feel that sulpharsphenamine is therapeutically a weaker product than the other arsphenamines. Theoretically, at least, hemorrhagic conditions should be more likely to occur after sulpharsphenamine."

Dr. Paul A. O'Leary, Rochester, Minn.: "I have found it a very toxic drug, particularly in the production of the blood dyscrasias, but by the use of small doses in patients who are under constant observation in the hospital, I have been able to keep the toxic effects at a very low level. However, as a medicament for general use in ambulant patients, I think its toxic manifestations are too severe and too numerous, and believe that the action by the Council on Pharmacy and Chemistry would be justified."

Dr. M. B. Parounagian, New York City: "This drug was first called to my attention five years ago while in Vienna—later at Hoechts a/M. I was offered a liberal supply to take with me, which I declined. I am not in favor of intramuscular use of arsenicals at all."

The following selected statements are from the considerable group of men who feel that sulpharsphenamine still has a place in medicine:

Dr. Harry E. Alderson, San Francisco: "In my opinion sulpharsphenamine is of some use for intramuscular injections in those cases where intravenous therapy is not possible. It appears to be of use in treatment of lues in infants and children."

Dr. A. W. Stillians, Chicago: "No. I believe it would leave a vacancy, and I do not consider the greater toxicity of enough importance to prevent its use in appropriate cases."

Dr. Richard L. Sutton, Kansas City, Mo.: "No, for it fills a need, and if used circumspectly, as all of the salvarsans should be, I consider it safe."

Dr. Oliver S. Ormsby, Chicago: "As indicated from above answers, our personal experience would not recommend withdrawal of the drug.

"Some time ago I wrote you concerning some clinical experience with sulpharsphenamine. Among others I quoted the case of a doctor to whom we gave thirty injections of sulpharsphenamine and in whom the spinal fluid was changed from much activity to normal.

"As this particular drug is used largely by us in cases of central nervous syphilis, and as these cases are rather few in number in our practice, our experience is not very large."

Dr. Jay F. Schamberg, Philadelphia: "Sulpharsphenamine, which, as you know, is closely related chemically to neoarsphenamine, is chiefly valuable because it is well borne by intramuscular injection. I am an advocate of very conservative dosage with all of the arsphenamines, and make up for it by combined treatment with bismuth and other remedies.

"We find, however, that in doses of 0.1 and 0.2 Gm., sulpharsphenamine is often valuable in congenital syphilis, and is alleged to be helpful at times in neurosyphilis. I believe that it should not be used intravenously, inasmuch as it is more hemolytic than neoarsphenamine and distinctly more hemolytic than the old arsphenamine."

Dr. William H. Goeckerman, Rochester, Minn.: "The reason I answer No. 3 as I do is this: I consider sulpharsphenamine a very dangerous drug, especially when one is treating a large number of patients and is therefore in part dependent upon assistants. I should, however, like the drug at my disposal in an occasional case because of its therapeutic efficacy."

A very illuminating report was received from Dr. Albert Pfeiffer, director, Division of Social Hygiene, State Department of Health, New York State. He does not think that the Council would be justified in withdrawing this preparation from further recognition. His remarks are as follows:

"The New York State Department of Health started to supply sulpharsphenamine for the treatment of indigent cases in 1925 and the demand has proceeded according to the following figures:

Year	Arsphenamine in Grams	Sulpharsphenamine in Grams
1925	4,109	3,326
1926	4,012	4,809
1927	2,957	8,192
1928	2,498	11,953
1929	5,242	19,752
1930	5,276	24,641
1931	5,172	26,169

"The factors in favor of sulpharsphenamine have been:

"1. Its relative safety to life. Our experience corresponds with the laboratory tests on animals for relative toxicity.

"2. Its applicability to local injections. This is most important from the public health point of view as many rural physicians are not prepared to do intravenous therapy, and even in a state like New York the question of syphilis control has this important rural factor to be considered.

"3. Its chemical stability. This allows solutions to be prepared a considerable time before a large clinic is started, and the speed with which sulpharsphenamine can be administered has made possible the handling of a large group of patients by a small personnel. This situation has been very noticeable in state institutions; for instance, in one prison the class under treatment has gone as high as 400. In many clinics one physician only is available to treat 50 to 100 patients in an afternoon.

"4. Sulpharsphenamine has proved to be the most effective and convenient preparation in the treatment of congenital syphilis. Most syphilologists seem agreed upon this point.

"5. From the public health point of view dealing not only with physicians experienced in the treatment of syphilis but with general practitioners in rural areas, the distinct

advantage of sulpharsphenamine is that the reactions which occur are usually of a delayed type and not the acute type which requires marked skill to handle.

"The commonest reaction seems to be a peripheral neuritis which might result from any arsenical, and a dermatitis which fortunately is preceded by the danger signal of generalized itching. Regarding the fatal cases of encephalitis resulting from sulpharsphenamine, only two such cases have been reported in New York State during the period and from the physical condition of the patients, the fatal result would probably have followed the use of any arsphenamine. Blood dyscrasias from the use of sulpharsphenamine have been relatively rare and no deaths have been reported in this state. In three state institutions over an observation period of two years, patients were treated by doses of 0.9 gram without deaths or severe reactions. This dose was about double what I recommended and was finally reduced mainly due to the arsenical neuritis the patients exhibited.

"Considering the large amount used in this state yearly (26,169 grams for indigents alone in 1931) in many cases quite carelessly without physical examinations to ascertain the power of the patient to handle and to eliminate the drug, possible visceral involvement, or without preliminary preparation by bismuth in old and latent cases, it would seem that the drug has withstood a vigorous test as to safety. My personal view is that sulpharsphenamine is the safest of our arsphenamines available when given weekly in doses of 0.45 gram or probably as high as 0.6 gram. Under dosage in the text of findings of the Council, I believe it would be of value to put the dilution to 20 cc. of water for intravenous use because a very common cause of immediate nausea or vomiting is rapid injection, which is often done. If 20 cc. are used it overcomes this factor in many of the cases. Local injections seem best tolerated if but 1 cc. of water is used for either 0.1 gram or a larger dose. The experience of our large clinics in this state covering several years seems to prove this.

Deaths from Arsphenamines Reported in New York State

Year	Arsphenamine	Sulpharsphenamine	Neoarsphenamine
1926	1 (poisoning)	0	1 (uremia and cardiac failure)
1927	0	1 (encephalitis and meningitis	0
1928	0	1 (encephalitis)	0
1929	1 (nephritis acute)	0	3 (anaphylactoid reaction, nephritis, dermatitis and influenza)
1930	0	1 (dermatitis exfoliativa)	0
1931	0	1 (poisoning)	3 (myelitis of cord and peripheral neuritis, enteritis, dermatitis exfoliativa)
Total	2	4	7

In view of the diversity of opinions and the considerable group of men who still feel that sulpharsphenamine has a place in the treatment of syphilis, the Council decided for the present to retain sulpharsphenamine in New and Nonofficial Remedies but to revise the description of the drug to give a more detailed warning concerning the dangers and limitations of its use. The statement of actions, uses and dosage of sulpharsphenamine has been revised to read as follows:

"Actions and Uses.—The same as those of neoarsphenamine; it is probably somewhat more stable in solution in the presence of air, and it permits of intramuscular injection. In terms of percentages there seems to be a higher incidence of reactions following the use of sulpharsphenamine, far more, in fact, than after the use of the other arsenicals employed in the treatment of syphilis. These reactions consist in (*a*) dermatitis, (*b*) hemorrhagic eruptions, (*c*) meningovascular reactions, (*d*) aplastic anemias, some of them even of agranulocytic angina and often with lethal exitus. All patients under treatment with sulpharsphenamine should be followed closely by the physician for evidence of reaction. The drug probably has a place, however, and occasionally can be used by the intramuscular route in the treatment of heredosyphilis and in certain cases in which the patient has such poor veins that intravenous therapy is out of the question.

"Dosage.—For intramuscular or subcutaneous use the drug is dissolved in sterile, freshly distilled water in the proportion of about 0.1 Gm. to 3 cc.; for intravenous use the maximum dose should probably not exceed 0.4 or at the most 0.5 Gm."

LUPULIN-AGAR, SIMARUBA-AGAR, SUMBUL-AGAR, TANNIN-AGAR AND GAMBIR-AGAR NOT ACCEPTABLE FOR N. N. R.

A series of agar preparations, each stated to be "impregnated" with a preparation of a stated drug, is marketed by the Reinschild Chemical Company, New Rochelle, N. Y. Among these are: Lupulin-Agar, stated to be "Agar impregnated with Lupulin, 100 Gm. containing 3.25 Gm. Lupulin"; Simaruba-Agar, stated to be "Agar impregnated with Simaruba, 100 Gm. containing 100 cc. of a 20% tincture of Simaruba"; Sumbul-Agar, stated to be "Agar impregnated with Sumbul; 100 Gm. containing 100 cc. fluid extract Sumbul; U. S. P." though no preparation of Sumbul is in the U. S. P. X; Tannin-Agar, stated to be "Agar impregnated with Tannin; 100 cc. containing 3.25 Gm. Tannin"; and Gambir-Agar, stated to be "Agar impregnated with Gambir, 100 Gm. containing 200 cc. Tinctura Gambir Composita, U. S. P."

Lupulin-Agar, Simaruba-Agar and Sumbul-Agar are proposed by the manufacturer for use in "Neurotic Intestinal Disturbances," "Diarrhoeal Conditions" and "Neurotic Intestinal Disturbances," respectively. Since the value of lupulin, of simaruba, or of sumbul has not been established in scientific medicine, the Council refused recognition to preparations containing them. Tannin-Agar and Gambir-Agar are proposed by the manufacturer for use in "diarrhoeal conditions (acute, and principally chronic)." Since the jelly formed when agar swells in water facilitates the development of bacteria, it is apparent that agar is not a desirable vehicle in the treatment of diarrhea and other irritative conditions of the gastro-intestinal tract. The dosage of Gambir-Agar recommended on the submitted trade package (1 teaspoonful, 5 cc.) represents less than 8 per cent of the average dose of agar and approximately that percentage of the dose of Gambir. The label on the package of Tannin-Agar states that the dose is 1 teaspoonful and that this amount represents ½ grain of tannic acid. The average dose of tannic acid U. S. P. is 0.5 Gm. (8 grains); hence the recommended dose of Tannin-Agar contains one-half the average dose of agar and one-sixteenth the average dose of tannic acid.

The Council declared Lupulin-Agar, Simaruba-Agar, and Sumbul-Agar not acceptable for New and Nonofficial Remedies because the use of lupulin, simaruba and sumbul is not justified, and declared Tannin-Agar and Gambir-Agar unacceptable because agar is not an acceptable vehicle in the treatment of irritative conditions of the gastro-intestinal tract, and because the dosage of the astringents in these fixed-ratio preparations appears to be inadequate.

HEPATEX P. A. F. NOT ACCEPTABLE FOR N. N. R.

Hepatex P. A. F. (Evans Sons, Lescher & Webb, London, England, Thomas A. Hedley, New York, American agent) was submitted for the Council's consideration as another liver preparation for intravenous and subcutaneous administration in the treatment of pernicious anemia. It is stated that 5 cc. of the preparation represents 100 Gm. of mammalian liver. The information supplied concerning the preparation of the product appeared to be in most respects consistent with the methods described by Cohn et al. for purifying liver extracts suitable for intramuscular and intravenous administration; however, the statement is made that from the watery extract "the protein

matter and other inactive constituents are removed by a special secret process," and no further information as to this process was supplied. The firm presented tests on rabbits intravenously to support the claims of absence of poisonous metals and proteins, blood pressure fraction and toxicity. For clinical evidence of the effectiveness of the product the firm referred to reports in British journals covering nine cases in which Hepatex P. A. F. was used with apparent success, and in none of which is there mention of untoward effects following intravenous injection.

The Council has not permitted the use of proprietary names for the several liver extracts thus far accepted. The firm pleads in favor of Hepatex P. A. F. that it is descriptive (the P. A. F. apparently stands for "pernicious anemia factor"), that it distinguishes this product from that for oral use and from other products, and that it was "isolated and produced as the result of lengthy chemical and biological research." These arguments, however, offer no reason why the Council should depart from its established policy for this class of preparations.

The advertising, supplied by the American agent, was unacceptable in that it referred to unacceptable articles; but revised advertising has since been submitted with these names omitted from one page, though they still appear on others. The attention of the firm was drawn to the statement in a circular that Hepatex P. A. F. is "the best preparation of its kind."

The firm was informed that the product marketed as Hepatex P. A. F. might be made acceptable (*a*) if the proprietary name was replaced by a descriptive name, such as "Liver Extract for Intramuscular Use"; (*b*) if the recommendation for its intravenous use was discontinued or convincing evidence of its safety submitted; (*c*) if the objection to the "secret process" was removed, and (*d*) if the claim in the advertising circular that the product is recognized all over the world as "the best preparation of its kind" was abandoned. In its reply the firm stated that its product has been used in some hundreds of cases without a report of untoward effect. The firm submitted a letter from Dr. John F. Wilkinson, director of the Department of Clinical Investigation and Research, Royal Infirmary, Manchester; but Dr. Wilkinson's letter is merely a statement of opinion and does not serve as proof. The firm stated that it is not willing to disclose the details of the "secret process" by which the product is obtained. The firm has not indicated willingness to withdraw the claim "the best preparation of its kind."

The Council declared Hepatex P. A. F. unacceptable for New and Nonofficial Remedies because it is marketed under a proprietary, insufficiently descriptive name without adequate declaration of composition, because there is no adequate evidence for the safety of the recommended intravenous use, and because the claim that the product is "the best preparation of its kind" is unwarranted.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

DIPHTHERIA IMMUNITY TEST (SCHICK TEST)

(See New and Nonofficial Remedies, 1932, p. 395).

Parke, Davis & Co., Detroit.

Diphtheria Toxin Diluted for Schick Test.—Marketed in packages (Bio. 75) of one vial containing 1 cc. of diluted diphtheria toxin, sufficient for ten tests; and in packages (Bio. 77) of one vial containing 10 cc. of diluted diphtheria toxin, sufficient for 100 tests. The dose is 0.1 cc. of the diluted toxin or one-fiftieth of the minimum lethal dose of diphtheria toxin for a guinea-pig of 250 Gm. weight. As a means of control, the control for the Schick Test (Bio. 79), representing diluted diphtheria toxin heated sufficiently to destroy the specific exotoxins, is supplied.

DIPHTHERIA TOXOID (See New and Nonofficial Remedies, 1932, p. 382).

Parke, Davis & Co., Detroit.

Diphtheria Toxoid.—(See New and Nonofficial Remedies, 1932, p. 383). —Also marketed in hospital packages (Bio. 2103) of one vial containing 30 cc. of diphtheria toxoid.

Committee on Foods

GENERAL COMMITTEE DECISIONS

THE COMMITTEE ON FOODS AUTHORIZES THE PUBLICATION OF THE FOLLOWING GENERAL COMMITTEE DECISIONS ADOPTED FOR ITS OWN GUIDANCE AND FOR THAT OF FOOD MANUFACTURERS AND ADVERTISING AGENCIES ON FOOD COMPOSITION AND FOOD ADVERTISING.

RAYMOND HERTWIG, Secretary.

IODIZED SALT, AND GOITER AN IODINE DEFICIENCY DISEASE

Iodine, an essential chemical element for normal nutrition, may be insufficiently furnished by food and drink and cause simple goiter, an iodine deficiency disease. The prevention of goiter is conceived to be largely a nutritional problem depending on the regular addition of a definite small quantity of an iodine compound, or an adequate quantity of an iodine rich food, to the diet inadequate in this element. A favorable practical method for dispensing the necessary additional food iodine to the public to supplement that naturally present in foods and drink is the fortification of table salt with a definite quantity of a suitable iodine compound.

Although supplemental iodine supplied through salt or other special foods may prevent goiter that would otherwise occur or cure incipient cases, the simple administration of iodine in this manner is not a "cure-all." The prevention of goiter is a matter of normal nutrition; the cure of goiter is a medical problem. All goiter cases should be under efficient medical supervision.

An "accepted" iodized salt shall contain one part of sodium or potassium iodide for each 5,000 parts of salt (approximately 160 parts of iodine per million parts of salt), or the iodine equivalent of any other suitable iodine compound. Iodized salt containing more than this quantity is considered a medicament not to be advertised to the public for table and cooking uses.

VITAMIN CLAIMS IN FOOD ADVERTISING

Indefinite or general vitamin claims are vague, noninformative and misleading and do not permit a distinction between foods as sources of the respective vitamins. Vitamin claims shall stipulate the specific vitamin or vitamins present. Vitamins present in a food in insufficient quantity to contribute in any significant manner to the respective vitamin value of the diet do not warrant mention. It is desirable that warranted vitamin claims be expressed in appropriate terms indicative of the relative potency of the food as a source of the vitamins in the dietary schedule. Foods may be considered relatively as fair, good and excellent or rich sources of vitamins.

Relative distribution of the vitamins in the various foods is presented in tables by Sherman (Chemistry of Food and Nutrition, ed. 4, 1932) and by a committee appointed jointly by the Lister Institute and the Medical Research Council of England (Vitamins: A Survey of Present Knowledge, 1932). These tables should serve as a guide for comparative vitamin claims for foods in advertising.

VAGUE MINERAL CLAIMS

Vague or nonspecific "mineral" claims or statements in food advertising may, either directly or indirectly, signify or imply the presence of all the nutritionally valuable mineral elements in physiologically significant quantities in the advertised foods. Such vague statements are not properly informative, are misleading and deceptive, and promote bad advertising practices. Advertising should correctly, properly and explicity instruct the public. "Mineral" claims should stipulate the individual element or elements intended for attention. Elements not present in nutritionally significant amounts in a food and in the quantity of the food likely to be consumed in the diet do not warrant mention. "Mineral" claims should name those elements only which are contributed in substantial physiologic amounts by the respective foods in the quantities ordinarily consumed in the diet.

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SATURDAY, NOVEMBER 12, 1932

INSULIN AND HUNGER

Insulin has recently been recommended to make thin patients fat, and the clinical results seem striking.[1] In a few instances as much as from 10 to 20 pounds (4.5 to 9 Kg.) was gained in almost as many days. This effect was apparently due to the improvement in the patient's appetite. Nahum and Himwich [2] of New Haven gave as much as from 45 to 65 units a day to four undernourished but otherwise normal women. They point out, as have others before them, that hunger was greater and that their patients not only consumed much more food but did so with relish and gusto.

This effect of insulin on the appetite is probably due to its stimulating influence on the functional activity of the stomach. Bulatao and Carlson,[3] in 1924, first showed that insulin augmented gastric motility and that dextrose injections abolished it. The same effects were then noticed in man.[4] These observations have been amply corroborated during the past few years [5] and found to apply to gastric secretion as well as to motility. The most extensive study of insulin on gastric function has been made recently by a Belgian observer, La Barre.[6]

La Barre adduced experimental evidence that it was primarily the low blood sugar which increased gastric activity and that this included not only its muscular but also its secretory activity. Thus, hepatectomy, which produces hypoglycemia, brought about the same effect as insulin. Dextrose solutions given intravenously, by raising the blood sugar to normal, abolished this stimulating effect immediately. This inhibiting effect of dextrose occurred only, however, when the blood sugar was low for there was no change in gastric activity when it was given to an intact dog with a normal level of blood sugar, a result noted also in experiments by Quigley and Hallaran.[7] In extensive cross-circulation experiments, La Barre was able to show that the hypoglycemic blood of one animal, passed through the cerebrum of a second animal, augmented gastric function in the second even though all connections with the cerebrum were severed save the vagus nerves. This seemed to show that the impulses to increased gastric activity were transmitted by the vagus and originated because the blood supply to the brain was low in its content of sugar. Additional proof that the vagus mediated these impulses was shown by their immediate cessation on an injection of atropine, a result also noted by others in man.[4]

It is interesting to correlate these observations with the well known rôle of the vagus in the production of hunger and in augmenting the gastric function. Hunger is perhaps merely nature's way of making known that the blood sugar is low and needs replenishing. If the experiments described are confirmed, the mechanism seems clear. Blood of low sugar content under ordinary circumstances may be able to start impulses down the vagus nerve that stimulate gastric secretion and motility; and it is the increased peristalsis, which in turn registers in consciousness the gnawing emptiness, that demands food. Such a mechanism would illustrate anew the well adjusted and purposeful relationship between chemical, nervous and psychic states, as well as explain the remarkable effect of insulin on appetite. Appetite is, no doubt, often subnormal because it is controlled by the ruthless dictates of fashion or because anorexia is not infrequently part of the mental maladjustment in many instances of malnutrition.

1. Nichol, E. S.: Insulin Fattening: Late Results in Sixty-Three Cases, South. M. J. **25:** 405 (April) 1932.
2. Nahum, L. H., and Himwich, H. E.: Insulin and Appetite: I. A Method for Increasing Weight in Thin Patients, Am. J. M. Sc. **183:** 608 (May) 1932.
3. Bulatao, E., and Carlson, A. J.: Effect of Experimental Changes in Blood Sugar Level on Gastric Hunger Contractions, Am. J. Physiol. **69:** 107 (June) 1924.
4. Quigley, J. P.; Johnson, V., and Solomon, E. I.: Action of Insulin on the Stomach of Normal Fasting Man, Am. J. Physiol. **90:** 89 (Sept.) 1929.
5. Cascão de Anciães, J. H.: Insulin and Gastric Function, Arch. f. Verdauungskr. **42:** 337 (April) 1928; abstr., J. A. M. A. **91:** 363 (Aug. 4) 1928. Meyer, P. F.: Action of Insulin on Gastric Secretion, Klin. Wchnschr. **9:** 1578 (Aug. 23) 1930; abstr., J. A. M. A. **95:** 1461 (Nov. 8) 1930. Roholm, K.: Effect of Intravenous Injection of Insulin on Gastric Secretion, Acta med. Scandinav. **73:** 472 (Sept. 27) 1930; abstr. J. A. M. A. **95:** 1954 (Dec. 20) 1930.
6. La Barre, J.: Les fonctions contractiles et sécrétoires de l'estomac en rapport avec les variations du métabolisme glucidique, Bull. Acad. roy. méd. belgique **11:** 598-651, 1931.
7. Quigley, J. P., and Hallaran, W. R.: The Independence of Spontaneous Gastro-Intestinal Motility and Blood Sugar Levels, Am. J. Physiol. **100:** 102 (March) 1932.

RACIAL AND DIETARY FACTORS IN BASAL METABOLISM

The basal metabolic rate has justly come to be regarded as one of the important physiologic constants of the body. The normal values for heat production have been established within the past three decades by American investigators, chiefly as the result of the efforts of Du Bois, Boothby and F. G. Benedict. As is well known, the postabsorptive metabolism is affected by sex, age, and size or surface area. To these determinants, it would now appear, it may be necessary to add the hereditary factor of race and, possibly, the environmental effect of dietary habits. It is known, of course, that different investigators have reported that dietetic, racial, climatic and other variations, apart from those of pathologic conditions, influence the basal metabolism, but the results were frequently incon-

clusive or contradictory.[1] Because the normal variations may be as much as ± 10 per cent, and occasionally even more, it is obvious that slight differences, though real, might not appear significant unless the number of cases was sufficiently large or the experimental factors were carefully controlled. In 1919, Benedict, Miles, Roth and Smith [2] reported the surprising fact that the basal heat production in a group of young men was lowered 15 or 20 per cent by unusual dietary means. This observation was made during a war-time study of the effect of restricted food intake on human health and efficiency. The reduction was produced within a few weeks following the restriction to a daily ration averaging only 1,950 calories, or about two thirds to a little over one half of the customary intakes of the subjects.

Apart from these determinations, the earlier efforts of the Carnegie Institution Nutrition Laboratory [2] to verify the claims of abnormal metabolism were largely negative. Within recent years, however, the study has been enlarged to include the estimation, with the aid of numerous collaborators, of the basal metabolism of several races in various parts of the world. A brief summary of these results has recently been published.[3] There are now available fairly extensive data of the heat production of orientals residing in the United States, and of natives in Mexico, India and Australia. As a result of three expeditions to Yucatan it was established that the basal metabolism of the male Maya averaged 6.5 per cent higher than that of Caucasian men. On the other hand, women of South India had a metabolism averaging 17.4 per cent below Benedict's standards for white women. Similar low figures were obtained with the Kokata aborigines of Australia. While such deviations from the American standards may be explained partly on the basis of different climate and food, there are reasons for believing that the racial factor is more directly concerned. Thus, a study of the postabsorptive metabolism of pure-blooded American born Chinese girls showed an average metabolism 9 per cent below the standards for white girls living under comparable conditions. The conclusion that the racial factor is intimately involved in determining the level of heat production is also in harmony with the earlier demonstration that Chinese and Japanese women of college age, living in the United States and subsisting on American rations for at least a year, have a much lower metabolism than that of their American college mates.

That eventually the diet may exert an effect on the basal metabolic rate is indicated by the recent contribution of Wakeham and Hansen.[4] These investigators find, in twenty lifelong vegetarians ranging in age from 18 to 65 years, a basal metabolism averaging 11 per cent below the Du Bois standards. The range in values extended from — 8 to — 17 per cent, the figures being in every case below the normal levels. The fact that significant differences have not always been found in vegetarians is explained by the observation that from six to eight years seems to be required before the effect of the diet is manifest. Although the subjects that were studied consumed milk and sometimes eggs, it is stated that the diet tended toward the low protein type. Occasional lapses from strict lactovegetarianism appeared to have no effect on the average heat production.

The Colorado workers [4] offer as a possible explanation for the lower heat production the suggestion that a persistent decrease in the supply of amino-acids to the body cells brings about an adjustment of the metabolic processes by which there results a diminished loss of the potential energy of the food. The lower metabolism indicates an increased mechanical efficiency of the body as a heat engine. No evidence, however, is presented regarding the protein content of the diet or the amino nitrogen or nonprotein nitrogen concentration of the blood. The results as they stand, however, emphasize the fundamental constancy of the basal heat production, since marked alterations in dietary habits result in minor readjustments only after several years. It would be extremely interesting to reverse the experiment, if possible, and to study the effect in relation to time of an ordinary mixed diet on the acquired lower metabolism of lifelong vegetarians.

1. A discussion of the variations of basal metabolism in health and disease is presented in the treatise of Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams and Wilkins Company, 1931, Interpretations, p. 1.

2. Benedict, F. G.; Miles, W. R., and Smith, H. M.: Human Vitality and Efficiency under Prolonged Restricted Diet, pub. 280, Carnegie Institution of Washington, 1919.

3. Benedict, F. G.: The Racial Element in Human Metabolism, Am. J. Physical Anthropology **16**: 463 (April-June) 1932.

4. Wakeham, G., and Hansen, L. O.: The Basal Metabolic Rates of Vegetarians, J. Biol. Chem. **97**: 155 (July) 1932.

NOBEL PRIZE IN MEDICINE FOR 1932 AWARDED TO SHERRINGTON AND ADRIAN

The Nobel Prize in Medicine for 1932 has been awarded to two British investigators, Sir Charles Scott Sherrington, professor of physiology at Oxford University, and Dr. Edgar Douglas Adrian, professor of physiology at Cambridge University. The honor bestowed on Professor Sherrington is a belated recognition, by the Nobel Prize Committee, of his many monumental contributions to knowledge of the physiology of the nervous system made during the past forty years. Early in his career he mapped out the motor area of the cerebral cortex of the chimpanzee, thus establishing the character of cerebral localization of function. Another important discovery made by him was that of decerebrate rigidity—an extensor hypertonus of the legs of a mammal following the section of the brain stem just above the pons. This discovery led to the epoch-making work of Magnus and his associates in body righting and postural reflexes. Professor

Sherrington is perhaps best known for his thoroughgoing study of the reflex equipment of the "spinal" mammal, in which he discovered the phenomenon of "reciprocal innervation," a reflex relaxation of one muscle or set of muscles simultaneously with the contraction of another group of muscles, the two groups constituting anatomic antagonists. Thus, flexors and extensors, instead of working against each other, actually are made to work together in the execution of both flexion and extension, which results in the movements being carried out with a greater degree of exactitude than would be impossible by the action of one group alone. His work on the spinal mammal was reported in a series of lectures given at Yale University and published in 1906 under the title "Integrative Action of the Nervous System," which has become one of the classics of physiologic research. That other scientific bodies were not so tardy in recognizing Professor Sherrington's accomplishments is shown by his election to the presidency of the Royal Society, his membership in many foreign scientific societies, including the National Academy of Science at Washington, and the bestowal on him of honorary degrees by seventeen universities.

Adrian's researches began on the isolated peripheral nerve. At first, with Lucas, he clarified much of the behavior of nerves in transmitting crucial messages. The index of a propagated nerve impulse was again the contraction of an attached muscle and failed to discriminate the action of an individual axon from the total. With the advent of a practical amplifying technic, however, the nerve action currents could be studied with a precision not before possible, and Adrian utilized these in his further analysis. Single nerve fibers were activated by normal stimulation of single end organs, or after destruction of the connections of all but one. Detailed information on mechanisms of sensory stimulation rapidly resulted, and the general relationship, that stimulus intensity is reflected in afferent impulse frequency, clearly emerged.

One of the first fruits of Sherrington's later approach was the delineation (in cats) of the myotatic, or stretch, reflex, not unrelated to his earlier discovery of decerebrate rigidity. Pull on the tendon of a muscle led to reflex shortening in response to continued tension, as in posture and tone of antigravity muscles. Adrian obtained his first success with single end organs by pulling a frog's muscle and recording the volley set up in a single afferent fiber. These studies resulted in a clearer picture of reflex tone that helped to settle the cloudiness of conceptions of this problem. Many clinical neurologists as well as physiologists have been interested in this work, for spasticities contribute greatly to human invalidism. Neurologists have followed his work with their own researches on the disturbances in tone mechanism appearing in disease.

The discharge of motor neurons also was investigated by the electrical and mechanical technics, and complementary information was obtained. The occurrence of distinct, spontaneous and rhythmic changes in electrical state and irritability of ganglion cells was an important observation. It cannot fail to be of profound significance that receptor organs and nerve cells and, barring striking quantitative differences, the nerve fiber itself have been shown to function on the same simple plan. Professors Sherrington and Adrian have made significant additions to knowledge of the dynamics of the normal nervous system, a knowledge that is basic for diagnosis and therapy in nervous disorders.

Current Comment

ELECTRIC CURRENT AND ELECTRICAL MEDICAL APPARATUS

As most people know, the common lighting circuit is of the alternating current type with a 60-cycle frequency. Throughout western Michigan, until recently, the frequency of the current furnished by the Consumers Power Company, which distributes electric energy in that region, has been 30 cycle. When it was decided to change the current frequency to conform to the common standard, the matter became important to physicians who use electrical therapeutic equipment. The Consumers Power Company offered to rebuild in its own shops any apparatus—domestic, commercial or otherwise—that necessitated a change of construction to meet the requirements brought about by the change of frequency. Some manufacturers of electrical therapeutic apparatus insisted that any changes required in such apparatus should be made by themselves, while others went so far as to oppose any rebuilding and recommended the purchase of new equipment. The extent, however, of the frequency change project in western Michigan, which included rebuilding the entire utilization system of such cities as Grand Rapids, Muskegon, Cadillac and Manistee, made it economically possible for the power company to assemble skilled personnel and adequate shop facilities for changing not only commercial equipment but also therapeutic equipment to the equivalent 60-cycle operation. One manufacturer of mercury vapor arc air-cooled quartz lamps had declared that, unless certain expensive replacements were made, the radiation from a 30-cycle lamp, when connected with a 60-cycle current, would be reduced one third. It was found, however, that a 30-cycle lamp could be operated on the 60-cycle current without any change whatever and, in fact, give an output that was equal to, or slightly greater than, that given on 30 cycles, while its power consumption was less than on the lower frequency. Another interesting investigation concerned the electrical characteristics of diathermy machines. One maker of diathermy apparatus asserted that machines rebuilt by the utility company had become unbalanced, as indicated by a sparking and pricking sensation when a patient was touched by any one during treatment. It was said that this condition was caused by failure of the power company to use new 60-cycle transformers supplied by the manufacturer. The

results of this investigation and of others are too technical to describe, but the details are available.[1] The power company demonstrated conclusively to the manufacturer that the diathermy machines could be made to operate as well on 60-cycle as on 30-cycle current, if not better. The results of both investigations were later confirmed by Dr. Albert Bachem, professor of biophysics at the University of Illinois. The incident is a fine example of the way in which new inventions or modifications, by their far-reaching effects, complicate the nature of medical practice.

Medical Economics

NEW FORMS OF MEDICAL PRACTICE

6. American People's League

The American People's League is a mutual benefit association organized under the laws of Illinois, Aug. 1, 1930. Its officers are J. M. Minnec, president, A. M. Minnec, treasurer, and F. A. Fierro, secretary.

It issues a "Membership Certificate" in its "Physician-Dentist Service Department" which reads as follows:

IN CONSIDERATION OF THE Membership Fee of $5.00 and the application, executed by the Member and the further payment of the monthly fee of $1.50, or quarterly fee of $4.25, or semiannual fee of $8.00 or annual fee of $15.00, to be paid by the member to the League at its office, on or before the time payable, during the continuance of this membership certificate, payments to be evidenced only by Gold Seal Certificates issued by the League's President, Vice-President or Secretary, the League hereby agrees, subject to the conditions and limitations hereinafter contained and endorsed hereon, to furnish Physician and Dentist Service to

Member .....

PHYSICIAN SERVICE

(1) To furnish at the Office of a regularly appointed physician of the League during the hours designated below, medical service or attendance for accidental injuries or sickness.

(2) To furnish medical service or attendance at home of member if member is physically unable to visit office of League's physician.

CONDITIONS

This service does not provide attendance or treatment for chronic or venereal diseases, nor treatment for any sickness until thirty days from date of this Certificate; nor for surgical operations where cutting of any kind is required; nor for Hospital expense or medicine.

Should the member be a woman, in case of child birth, after this Certificate has been in force and effect for three hundred consecutive days from date hereof, there shall be a service fee charged amounting to $....., which shall be paid by the member to the attending physician; prior to three hundred days the regular fee may be charged by the physician and same shall be paid by the member.

DENTISTS SERVICE

To furnish at the office of a regularly appointed Dentist of the League during the hours designated below. Dentists service consisting of advice on care of the teeth, cleaning when necessary, extraction and thorough examinations.

PHYSICIAN	DENTIST
Name	Name .....
Address	Address .....
Phone	Phone .....
Office Hours.....	Office Hours.....

The League reserves the right to substitute the above Doctors at any time.

This Certificate shall not lapse for non-payment of the service fee until the said fee is thirty days in arrears, when this Certificate becomes null and void without notice.

IN WITNESS WHEREOF the American Peoples League by its President and Secretary, has executed these presents at Chicago, Illinois, this

Countersigned by

..... By.....
Secretary President

The methods of marketing this service are shown by the advertisement in the Chicago *Defender*, a Negro organ:

A DOCTOR — ANY HOUR — ANY TIME

Physician-Dentist service rendered to men, women, 16 to 60 years of age, by a local Physician and Dentist in your neighborhood. The Physician will preserve your health, increase your efficiency, prevent sickness in every way possible and will give you treatment. The Dentist will take care of your teeth, clean them and extract them whenever necessary.

FREE — FREE — FREE — For a limited time only to all Members who join now, we will give absolutely free a $500 Accident and Health Policy. The Universal Policy covers a Universal need when sickness or injury stops you from working and also stops your income. If you carry a Universal Policy your income continues six months. Benefits paid monthly. In case of Accidental Death your beneficiary receives $500 cash. Prompt claim settlements. No red tape. Change of employment does not change the amount payable. Double benefits for travel accidents.

OR FREE ALSO — A $500 Life Insurance Policy which pays $500 in case of death from any cause. No Medical Examination required. Don't hesitate. Investigate today. It's better to have this protection and not need it, than to need it and not have it. Millions paid on claims by reliable Life and Accident Insurance Company which issues our Policy.

JOIN NOW—THE PHYSICIAN AND DENTIST SERVICE DEPARTMENT—MEDICAL SERVICE, DENTAL SERVICE
Local Physician—In Your Own Neighborhood—Local Dentist
Phone Normal 0748 and our Representative will call to see you.

AMERICAN PEOPLES LEAGUE
South Side Office—300 East 61st Street—Normal 0748
E. H. ATHERLY, SOUTH SIDE DISTRICT MANAGER
11 E. La Salle St.—Main Office—Andover 2235
AGENTS WANTED—MEN AND WOMEN

The "Physician's Service Contract" contains the following clauses:

Whereas the said League has members that require medical service and attention from time to time, the said Physician agrees for the consideration hereinafter stated, to furnish such service and attention, as may be required, under the following conditions, viz:

Physician's service and attention, at his office during his regular hours (as designated below) for accidental injuries or sickness.

Physician's service or attendance at home of member if member is physically unable to visit office of League's Physician.

This agreement does not provide attendance or treatment for any venereal diseases, nor treatment for any sickness until thirty days from date of Certificate; nor for surgical operations.

Where a Certificate is issued to a woman, and after the same has been in force for three hundred days (300), from date of issue, in case of childbirth the Physician shall charge a fee of $..... and collect the same from the said member; prior to this time he shall collect his regular fee charged in such cases.

If in the opinion of the American Peoples League the member has or does not receive proper care and treatment, and said League shall have the right to employ a Physician to give the required service (this Physician shall be from their own staff of regularly appointed Physicians), and the amount so expended shall be paid from the funds due or to become due said Physician in the district where such service was performed, providing said fee does not exceed $3.00 for each call.

This agreement is made for a term of one year and said Physician shall receive for such services to be rendered to the members of this League, allotted to his care and medical attention, the sum of $2.00 per member per year payable monthly.

IN WITNESS WHEREOF, the parties hereto have hereunto affixed their respective signatures.

These two documents indicate a wide spread between the annual payments of from $15 to $18, in addition to the $5 membership fee, and the $2 annual payment to be made to the physician. Just how much good medical service could be given for $2 a year is a question which it hardly seems necessary to discuss.

Just what benefits physicians are to expect from joining the scheme is explained in a letter to a Chicago physician in urging him to sign the contract:

Our aim is to notify all our present members or future ones of your appointment as our Staff Physician, and to direct them to call at your office for Medical Service and treatment and if you will co-operate with us by rendering good work to the members, they in turn will recommend you to their families, relatives, and friends who will then eventually become your patients, and thereby you receive a large patronage that you would not receive if we did not direct our members to call at your office for medical service and treatment.

Our plan and operation has been approved by officers and members of large organizations and our plan has been submitted to the American Medical Association. A South Side Doctor makes the voluntary statement that the Medical Service such as we are rendering proved to be very profitable in his practice.

Should you become affiliated with us as 50 other Doctors have, we immediately notify all the members within the vicinity of your office of your appointment and advise them to apply to your office for medical attention under the terms of their membership Certificate.

Further information concerning the workings of the plan is given in a letter from the president, Mr. J. M. Minnec, to the director of the Bureau of Medical Economics, which says:

Our Doctor's are obtained from the local neighborhoods wherein we operate. These Doctors must have a high grade reputation and in the majority of cases are also members of the American Medical Association

1. A brief, detailed report can be obtained by sending a self-addressed envelop bearing a three-cent stamp to the Secretary of the Council on Physical Therapy, American Medical Association, 535 North Dearborn Street, Chicago.

or the Chicago Medical Society. We assign to each Doctor a number of our members and we pay the Doctor for each member per year. The Doctor's service consists of medical service, to preserve the health of the member, and increase his efficiency, to prevent sickness in every way possible and minor treatment. This medical service however does not include chronic disease, venereal disease, nor operations. These services are to be arranged and paid by the member to the Doctor.

Our Dental services consists of advice on care of the teeth, cleaning and extraction as often as necessary by a Dentist who is a reputable, high grade Dentist in each neighborhood wherein we operate, and who is, in the majority of cases, a member of the American Dental Association.

We have scores of the highest grade Physicians and Dentists in the City of Chicago in different sections of the City, and we are proud to say that this plan which is in conformity with the ethics of the Medical and Dental profession, as well as your own statement, which you made on April 27th, 1931, at a meeting of the Chicago Medical Society when you made the statement that "The average Doctor has not been sufficiently aware of his importance and opportunities as a Health Advisor."

* * * * * * *

Our aim is similar to the Medical Association in so far as to uphold the dignity and the ethics of the Medical and Dental profession, and we are here at all times awaiting to learn of any plans or ideas from the Medical Association wherein we can be of assistance to all concerned.

Although the contract quoted promises only a decidedly limited service, which is nevertheless far more than any physician can afford to give for $2 a year, the circulars issued to prospective members tell the reader:

JUST THINK—you can have all the medical and Dental service for yourself as often as necessary at the office of our Resident Doctors to maintain your Health, to increase your efficiency, to prevent sickness in every way possible: and in addition to the above service—for a limited time only—we will give you absolutely free a $500 Life Insurance Policy, so that in the event of death (death is certain and always incurs additional expense), this Policy will help pay all expense, such as hospital bills, funeral bills and cemetery bills.

Right NOW is the time to decide. Tomorrow may be too late. Don't wait another moment. Fill out the application now, or ask for one of our representatives to call, without any obligation on your part.

The organization claimed a membership of 1,030 persons in March, 1931, but has not made its recent condition public. So far as can be ascertained, none of its officials have ever had any experience in connection with medical service. Its president is said to have been formerly known as Giacomo Minnecki and to have been engaged in the real estate business.

COMMENT

The demerits of this plan are numerous and flagrant:

It is primarily a scheme to make money for its owners. There is no security that the physicians will receive even the nominal $2 a year for giving as advertised "all the medical and dental service for yourself as often as necessary." The contracts with the member and the physician are so indefinite and loosely worded as to permit a wide variety of interpretations. There is no mention of any financial supervision, bonding or other security that the funds will be properly administered. In short, judging by its own literature and the statements of its officials, this is primarily a scheme to sell memberships for the benefit of the promoters. It is an example and a warning of the inevitable depths to which commercial schemes for providing medical service through lay exploitation may degrade the profession.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday and Wednesday from 10:40 to 10:45 a. m. (central standard time) over Station WBBM (770 kilocycles, or 389.4 meters).

The subjects for the week are as follows:

November 14. Keeping Baby Well in Winter.
November 16. Itch.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 11:45 to 12 M. over Station WBBM.

The subject for the week is as follows:

November 19. Sleeplessness in Children.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Clinical Society Meeting.—The sixth meeting of the Fort Smith Clinical Society will be held in Fort Smith, November 15, under the auspices of the staffs of the St. Edwards, Mercy, Spark's Memorial and St. John's hospitals. The following physicians will speak:

Charles S. Holt, Treatment of Empyema.
Charles S. Means, Obstetrical Analgesia.
Everett C. Moulton, Relation of Paranasal Sinusitis to Systemic Disease.
Herbert Moulton, Mastoid Disease.
Jesse E. Stevenson, An Opinion of Bran.
Samuel P. Stubbs, Importance of Food Inspection as Related to Public Health.
John M. Taylor, Tuberculosis of the Spine.
Sidney J. Wolfermann, Fractures at the Lower End of the Humerus.
Frederick H. Krock, Avertin in Surgery.
Ferdinand C. Helwig, Kansas City, Mo., Fatal Complications Following Operations on the Biliary Tract.
Ira H. Lockwood, Kansas City, Mo., Extrinsic Lesions Producing Gastro-Intestinal Symptomatology.

Dry clinics will be conducted by Drs. Walter G. Eberle on the prenatal examination; Ira F. Jones, sterility, and James H. Buckley, differential diagnosis: iritis, conjunctivitis and glaucoma, and operative clinics by James A. Foltz and Willis F. Rose. Dr. William R. Brooksher, Jr., will give an x-ray exhibit on gastro-intestinal malignancy.

CALIFORNIA

The Colver Lectures.—Dr. Russell M. Wilder, professor of medicine, Mayo Foundation Graduate School of the University of Minnesota, Rochester, will deliver the fifth series of the Colver Lectures at the College of Medical Evangelists, Los Angeles, November 15-17. The titles of Dr. Wilder's lectures are "Diagnosis of Parathyroid Overfunction," "Treatment of Obesity" (sponsored by the section of internal medicine of the Los Angeles County Medical Association), and "Spontaneous Hypoglycemia."

Personal.—Dr. Ira O. Church, health officer of Contra Costa County, will be assistant medical director of Alameda County under an emergency ordinance passed by the Alameda County board of supervisors. Dr. Church will take over the supervision of health centers of the county and will assume the duties of the county health officer. He has been with the Contra Costa health department since its establishment.——Dr. Smith McMullin, Yuba City, was elected national surgeon general of the United Spanish War Veterans at its convention in Milwaukee, August 25.

Lectures in Ophthalmology.—The Research Study Club in Ophthalmology and Otolaryngology of Los Angeles is conducting a winter lecture course. The first two lectures were given, November 3 and 10, by Drs. T. C. Lyster and Moisei N. Beigelman on "Etiology and Management of Secondary Cataracts" and "Etiology of Uveitis," respectively. Future lectures include the following of particular interest to ophthalmologists:

November 17, Dr. Alexander Ray Irvine, Treatment of Uveitis.
December 1, Dr. Clifford B. Walker, Observations in Glaucoma.
December 8, Dr. Morie F. Weymann, Conjunctivitis.
December 15, Dr. Archibald C. Macleish, Mental Status of Ophthalmologic Patient.

The following lectures will be of special interest to otolaryngologists:

November 14, Dr. Sylvan S. Goldberg, Developments of the Definitive Nose and Adjacent Structures.
November 21 and 28, Cecil Steiner, D.D.S., Orthodontia and Diagnosis of Need of Orthodontia, respectively.
December 5, Dr. William J. Mellinger, Santa Barbara, Treatment of Ear, Nose and Throat Conditions.
December 12, Dr. Andrew B. Wessels, San Diego, Treatment of Ear, Nose and Throat Conditions.

Dr. Conrad J. Baumgartner opened this group, November 7, with a talk on the bronchial system in the human being.

Dr. Haldane Lectures at University of California.—Dr. John B. S. Haldane, Sir William Dunn reader in biochemistry at the University of Cambridge, head of the genetic department of John Innes Horticultural Institution and Fullerian professor of physiology at the Royal Institution, London, is

giving a series of lectures as Hitchcock professor at the University of California. The first series opened, October 18, with an address on "Criticism of the Darwinian Theory." A second included three lectures on "Enzymes." November 9, Dr. Haldane spoke on "How Genes Act"; November 10, "What Genes Are: Wave Mechanics as a Basis for Philosophical Biology," and, November 14, he will lecture on "The Statistical and Matrix Algebra of Population: Problems Leading to Linear Difference Equations." In addition to lectures, Dr. Haldane will hold conferences and discussions with members of the faculty and advanced students.

CONNECTICUT

Annual Meeting of Surgical Society. — The fifteenth annual meeting of the New England Surgical Society was held at Hartford, September 30-October 1. Officers elected include Drs. Lyman Allen, Burlington, Vt., president; Henry Gildersleeve Jarvis, Hartford, vice president, and John M. Birnie, Springfield, Mass., secretary. The next meeting of the society will be in Boston. In addition to a dry clinic, the following program of papers was presented:

Appendiceal Abscess, Dr. Donald S. Adams, Worcester, Mass.
Operative Evacuation of the Small Intestine in Paralytic Stasis, Dr. David Cheever, Boston.
Recurrent or Persistent Jaundice in Youth, Dr. Willis E. Hartshorn, New Haven.
So Called Traumatic Arthritis, Dr. Frederic J. Cotton, Boston.
Choice of Approach in Thoracotomy for Acute Suppurative Pericarditis, Dr. Philemon E. Truesdale, Fall River, Mass.

At the annual dinner in the Hartford Club, Dr. Frank H. Lahey, Boston, gave the presidental address on medical economics. Judge Arthur F. Ells of the Supreme Judicial Court of Connecticut also spoke.

DISTRICT OF COLUMBIA

New Full-Time Faculty Members at George Washington.—Announcement has been made of the following new full-time faculty members at George Washington University School of Medicine:

Dr. Errett C. Albritton, professor of physiology.
Dr. Roscoe Roy Spencer, associate professor of hygiene and preventive medicine.
Leland W. Parr, Ph.D., associate professor of bacteriology.
John H. Hanks, Ph.D., assistant professor of bacteriology.
Elizabeth Verder, Ph.D., assistant professor of bacteriology.
Alden F. Roe, Sc.D., instructor in bacteriology.
William F. Hamilton, Ph.D., assistant professor of physiology.
Chester E. Leese, Ph.D., assistant professor of physiology.
Alice C. Roberts, Ph.D., associate in physiology.
Dr. George Brewer, instructor in physiology.
Vincent du Vigneaud, Ph.D., professor of biochemistry.
Helen M. Dyer, A.M., fellow in biochemistry.
Jesse Harmon, Ph.D., research assistant in biochemistry.
Dr. James L. Collins, fellow in anatomy.
Lane Allen, M.S., instructor in anatomy.
Phoebe J. Crittenden, Ph.D., instructor in pharmacology.
Dr. Thomas D. Woodson, professor of military science and tactics.

Clinical appointments include the following physicians:

Montgomery Blair, Jr., clinical instructor in pediatrics.
Radford Brown, professor of obstetrics and gynecology.
Paul F. Dickens, clinical instructor in medicine.
Addison McG. Duval, clinical instructor in psychiatry.
Theodore C. Fong, clinical instructor in dermatology and syphilology.
Bernard L. Hardin, Jr., clinical instructor in medicine.
Samuel Mayer Dodek, clinical instructor in obstetrics and gynecology.
George A. Holm, clinical instructor in medicine.
William H. Jenkins, clinical professor of otorhinolaryngology.
Loren B. T. Johnson, associate in pediatrics.
Spencer V. Meade, clinical instructor in medicine.
Samuel A. Silk, clinical instructor in psychiatry.
William B. Mason, professor of otorhinolaryngology.
Raymond W. Murray, clinical instructor in medicine.

FLORIDA

Ban on Shellfish. — Newspapers, October 18, announced that the Tampa health department had placed a ban on oysters and other shellfish taken from the waters of Hillsborough Bay, Sparkman Bay, the water-front at St. Petersburg, the area surrounding Shell Island and Coffeepot Bayou. Pollution of the oyster beds in the banned areas by sewage from Tampa and St. Petersburg makes shellfish from beds within the proscribed areas dangerous to the public health, it was stated.

Society News.—The Hillsborough County Medical Society was addressed, September 6, by Drs. Edgar F. Fincher, Jr., Atlanta, on "Surgery of the Sympathetic Nervous System." Dr. Fred H. Albee, New York, also spoke on aviation in medical practice. —— The Florida Midland Medical Society was addressed in Tampa, October 27, among others, by Drs. William Patterson, on "Importance of the Early Care of Strabismus in Children"; James R. Boulware, Jr., Lakeland, "Pyuria in Children," and Nathaniel L. Spengler, Tampa, "Dyscrinism in Infants and Children."

ILLINOIS

Society News.—At a meeting in Springfield, October 6, members of the Sangamon County Medical Society approved an amendment to the by-laws of the organization to establish the rank of member emeritus for physicians who have been in the society for thirty-five years or who have passed the age of 70. Dr. Harry L. Alexander, St. Louis, addressed the society at this meeting on arthritis.——Dr. Andy Hall, Springfield, addressed the St. Clair Medical Society and civic organizations in East St. Louis, October 7, on "Health Measures in Their Relation to the State."——Dr. Fred M. Smith, Iowa City, addressed the Peoria City Medical Society, October 18, on arteriosclerotic heart disease.

Chicago

Dr. Graham to Give Bevan Lecture.—The fourth annual Arthur Dean Bevan Lecture of the Chicago Surgical Society will be delivered at the City Club, December 9, in conjunction with the Institute of Medicine of Chicago. Dr. Evarts A. Graham, Bixby professor of surgery, Washington University School of Medicine, St. Louis, will be the lecturer; his subject, "Mediastinal Tumors and Their Treatment."

President's Night at the Central Society.—November 16 has been designated as "president's night" by the Chicago Medical Society. Dr. Edward H. Cary, Dallas, Texas, President, American Medical Association, will speak on "Leadership in the Solution of Medical Problems and of Local and National Health Matters," and Dr. Dean Lewis, Baltimore, President-Elect of the Association, will discuss "The Hospital and the Medical Profession." A symposium on heart disease will be a feature of general practitioners' night, November 30. The participants will be Drs. James B. Herrick, Samuel A. Levine, Boston, and James G. Carr. The third lay educational program will be sponsored by the society, December 7, when the speakers will be Robert M. Lee of the Chicago *Tribune* on "Health Education Through the Press"; Dr. William W. Bauer, director, Bureau of Health and Public Instruction, American Medical Association, "Health Education Over the Radio," and Louis Mann, Ph.D., rabbi, Chicago Sinai Congregation, "Health and Life."

Society News.—The Chicago Roentgen Society sponsored a symposium on parathyroidism, November 9, at the Palmer House. The participants were Drs. Max Ballin, Plinn F. Morse and William A. Evans, all of Detroit.——Prof. A. M. Dogliotti of the Royal University of Torino, Italy, addressed the Cook County Graduate School of Medicine, October 29, on "Recent Achievements in Peridural Surgical Anesthesia and Analgesia."——"Orthopedics in Europe in 1932" was the topic for discussion at the meeting of the Chicago Orthopedic Club, November 11.——Dr. Nell Treva Pattengale addressed the Chicago Council of Medical Women, November 4, among others, on "Radium as Used in the Present-Day Practice of Medicine."——The Chicago Surgical Society was addressed, November 4, among others, by Drs. Géza de Takáts and Henry W. D. MacKenzie on "Acute Pancreatic Necrosis and Its Sequelae."——Drs. Joseph C. Beck and Robert H. Good spoke before the Chicago Laryngological and Otological Society, November 7, on "Osteomyelitis of Bone of Face and Head with Recovery" and "Submucous Resection of the Nasal Septum," respectively.——A review of recent ophthalmic literature was presented before the Chicago Ophthalmological Society, October 24, by Drs. Louis Bothman and Leo L. Mayer.—— Dr. Philip H. Kreuscher, among others, addressed the Chicago Society of Industrial Medicine and Surgery, October 31, on "Fracture of Femoral Neck with Especial Reference to the Blood Supply of the Head."

INDIANA

Personal.—Dr. Eldridge M. Shanklin, Hammond, has been chosen editor of the *Journal of the Indiana State Medical Association*, and Mr. Thomas A. Hendricks, Indianapolis, managing editor.

IOWA

Annual Clinic.—The twenty-first annual medical clinic of the State University of Iowa College of Medicine, Iowa City, is being held, November 11-12. Dr. Ralph H. Major, professor of medicine, University of Kansas School of Medicine, Kansas City, Kan., gave an illustrated lecture, November 11, on "Medicine in Art and Caricature." The following physicians conducted clinics: Nathaniel G. Alcock, genito-urinary surgery; Cecil S. O'Brien, ophthalmology; Howard L. Beye, general surgery; Clarence E. Van Epps, neurology; Arthur Steindler,

orthopedic surgery; John B. Kessler, dermatology; Everett D. Plass, obstetrics and gynecology; Philip C. Jeans, pediatrics; Harold D. Kerr, x-rays; Harry P. Smith, pathology. Ward walks are included in the program as well as laboratory demonstrations.

MASSACHUSETTS

Physical Defects in Newsboys.—Dr. LeRoy M. S. Miner, dean, Harvard Dental School, Boston, in a recent report stated that nine out of every ten boys examined in the medical clinics of the Burroughs Newsboys Foundation in 1931-1932 had postural defects, 35 per cent of which were serious. An average of three cavities was noted in the teeth of each boy, and 61 per cent of the boys needed dental extractions; 32 per cent had flat feet and other conditions which were in every case associated with poor posture. All physical and mental defects are recorded through examinations at the clinics for the foundation on Beacon Hill. The staff of the clinic cooperates with the family physician in the correction of defects or, if necessary, directs the boys to public health units and other clinics for treatment. To continue with this work, the foundation is seeking funds. Checks should be made payable to the Burroughs Newsboys Foundation and sent to Mr. James J. Phelan, treasurer, 60 Congress Street, Boston.

MINNESOTA

Society News.—The Minnesota Pathological Society was addressed, October 18, by Drs. Elexious T. Bell on "Recent Studies on the Nephroses," and Raymond N. Bieter, Minneapolis, "Comparative Physiology of the Kidney."——Dr. Clyde A. Roeder, Omaha, was elected president of the Association of Resident and Ex-Resident Physicians of the Mayo Clinic and Foundation at its annual meeting in Rochester, October 14.

"Magnetic Healer" to Return to Sweden.—P. O. Olson, Minneapolis, pleaded guilty, October 3, to a charge of practicing healing without a basic science certificate. Olson, who refers to himself as a "magnetic healer" and who claims to have received a degree of "doctor of naturopathy" for the sum of $300 after attending school for one year in Minneapolis, has been making frequent trips from his home to Willmar and that vicinity. In 1931 he was ordered to desist from practicing healing without a license. He was arrested after an investigation by the state board of medical examiners in May, at which time he admitted that he had been in Harrison for the last two weeks in April and had received about $60 a week in cash from his treatment of patients. Olson was given a suspended sentence on the conditions that he pay Kandiyohi County's cost of the proceedings, which amounted to $32.20, and refrain from practicing healing in any manner whatever in Minnesota. He informed the court that he was not a citizen and expected to go back to Sweden.

MISSISSIPPI

Society News.—The Issaquena-Sharkey-Warren Counties Medical Society was addressed in Vicksburg, September 13, by Drs. George W. Gaines, Tallulah, La., on acute indigestion; Doctor A. Pettit, Vicksburg, osteomyelitis, and Thomas P. Sparks, Jr., Jackson, urologic problems.——At a recent meeting of the East Mississippi Medical Society the speakers included Drs. Leon S. Lippincott, Vicksburg, "Anemia in Disease"; Elbert L. Richardson, Louisville, "Acute Surgical Abdomen"; Franklin G. Riley, Meridian, "Diphtheria in Children"; Horton R. Casparis, Nashville, Tenn., "Tuberculosis During Childhood," and Dr. James M. Acker, Jr., Aberdeen, work of the society.

NEBRASKA

District Meeting.—At the twelfth annual meeting of the Seventh Councilor District Medical Society in Superior, October 27, the following physicians presented papers:

Frederick L. Smith, Rochester, Minn., Treatment of the More Common Conditions Resulting from the Break in the Vascular and Lymphatic Circulation of the Lower Extremities.
Charles W. Mayo, Rochester, Minn., Acute Intussusception in Children.
Rodney W. Bliss, Omaha, Coronary Disease.
Clayton F. Andrews, Lincoln, Surgical Aspects of Appendicitis.
Joseph J. Hompes, Lincoln, The Family Physician and the Cross-Eyed Child.
Weaver A. Rush, Beatrice, Conditions of the Lumbar Spine of Interest in Relation to Industrial Insurance.

At a dinner meeting, Dr. Charles W. M. Poynter, Omaha, spoke on "University Hospitals and Their Relation to the Profession and the Public," and Dr. Arthur E. Cook, Randolph, president of the state medical society, also made an address.

NEW YORK

Course on Treatment of Symptoms.—The committee on public health and medical education of the Medical Society of the County of Monroe presented a course of lectures on treatment of symptoms, in Rochester, October 24-28. The speakers were Drs. Herman O. Mosenthal, New York, on hypertension; Nelson G. Russell, Buffalo, edema; Alvan L. Barach, New York, dyspnea; Clayton W. Greene, Buffalo, angina pectoris and coronary occlusion; Burrill B. Crohn, New York, epigastric distress associated with meals.

Society News.—Drs. Louis A. Van Kleeck, Manhasset, and Herman T. Peck, Brooklyn, addressed the Medical Society of the County of Nassau, Hempstead, October 25, on "Problems of Organized Medicine" and "The Nurse, the Health Officer and the Physician," respectively.——A symposium on disease of the bones and joints will be presented at the annual meeting of the second district branch of the Medical Society of the State of New York, at Garden City, November 17, by Drs. Tasker Howard, Richard A. Rendich, Jr., Brooklyn, Frank S. Child, Port Jefferson, Otho C. Hudson, Hempstead, Walter C. A. Steffen, Flushing, Jerome Weiss, Brooklyn, and George Anderson. At the evening banquet Drs. Charles Gordon Heyd, New York, and Frank L. Babbott, Jr., Brooklyn, will discuss the medical practitioner's rôle in health promotion and Henry F. Vaughan, Dr.P.H., Detroit, will describe the Detroit plan of medical participation in public health work.

New York City

Queens County Graduate Courses.—Four courses of graduate instruction in medicine are being given in Long Island hospitals, under the auspices of the Medical Society of the County of Queens. Weekly lectures in operative surgery and diabetes were begun, November 7, to continue for four weeks; a course in obstetrics, November 8, to continue six weeks, and a course in the injection treatment of varicose veins will begin November 18, to run for six weeks.

Public Health on Forum Program.—Dr. Hugh S. Cumming, surgeon general, U. S. Public Health Service, and four members of the staff of the National Institute of Health, Washington, D. C., will present the program of the Science Forum of the New York Electrical Society, November 16. Dr. Cumming will describe the work of the institute; Dr. Maurice I. Smith will discuss jamaica ginger paralysis; Dr. Rolla E. Dyer, typhus fever; Dr. Roscoe R. Spencer, Rocky Mountain spotted fever, and Carl Voegtlin, Ph.D., the chemical attack on cancer.

Faculty Changes at New York University.—At a meeting of the council of New York University, October 24, the title of dean emeritus was conferred on Dr. Samuel A. Brown, who resigned as dean earlier in the year (THE JOURNAL, May 7, p. 1667). Dr. Austin Flint resigned as professor of obstetrics and was made emeritus professor. The following new appointments or changes in title were announced for the present year:

Dr. Richard T. Atkins, professor of otolaryngology.
Dr. Warren Coleman, professor of clinical medicine.
Drs. Wesley C. Bowers and Charles J. Imperatori, clinical professors of otorhinolaryngology.
Dr. Edwin W. Holladay, clinical professor of obstetrics and gynecology.
Dr. William E. Studdiford, Jr., associate professor of obstetrics and gynecology.
Dr. Clarence de la Chappelle and Elaine P. Ralli, assistant professors of medicine.
Dugold E. S. Brown, Sc.M., assistant professor of physiology.
Dr. William Goldring, assistant professor of clinical medicine.
Julius Klosterman, Sc.M., assistant professor of bacteriology and immunology.
Drs. Henry T. Burns and Claude E. Heaton, assistant clinical professors of obstetrics and gynecology.
Dr. Evan W. McLave, assistant clinical professor of medicine.

OHIO

Personal.—Dr. Howard T. Karsner, professor of pathology, Western Reserve University School of Medicine, Cleveland, has been elected member for the United States of the Comité Directeur of the International Society for Geographic Pathology.——Dr. Calvin Burrowes Holcomb, Bremen, was the guest of honor at a reception at his home on his ninety-fourth birthday, October 2.

Society News.—Dr. Ralph Pemberton, Philadelphia, will address the Cincinnati Academy of Medicine, November 14, on "The Newer Outlook on Chronic Arthritis." Dr. Jean R. Oliver, Brooklyn, will present "A Method of Studying Bright's Disease" before the academy, November 28.——Dr. Lyman G. Richards, Boston, will address the Cincinnati Otolaryngological Society, November 15, on acute streptococcic tracheobronchitis. ——Dr. William Gillespie addressed the Cincinnati Obstetrical

Society, November 10, on "Forceps and Occipitoposterior Positions."——Drs. Harold F. Koppe and Alva D. Cook addressed the Montgomery County Medical Society, Dayton, November 4, on "Dysthyroidism Following Pregnancy and Associated with the Menopause" and "Endocrine Disturbances in Toxemias of Pregnancy," respectively.——Dr. Edwards H. Porter, Tiffin, was elected president of the Northwestern Ohio Medical Association at the annual meeting in Lima, October 4. The next session will be held in Tiffin.

OREGON

Society News. — A symposium on spinal anesthesia was presented before the Portland City and County Medical Society, November 2, by Drs. George N. Pease, William K. Livingston and Louis P. Gambee.

Annual Registration Due December 1.—All practitioners of medicine and surgery holding licenses to practice in Oregon are required by law to be registered annually on or before December 1, with the secretary of the Board of Medical Examiners, and at that time to pay a fee of $5. A practitioner failing to register is subject to a penalty of $1 for each thirty days of default and his failure to re-register within ninety days after December 1 is a misdemeanor.

SOUTH DAKOTA

Society News.—A recent meeting of the Yankton District Medical Society at Yankton was addressed by Drs. Nathaniel G. Alcock, Iowa City, on "Transurethral Prostatic Resection"; Frank C. Smith, Yankton, "Furunculosis of the External Auditory Canal," and Lottie G. Bigler, Yankton, "Impressions and Experiences with the Federal Indian Clinic."——Dr. H. L. Smith, Rochester, Minn., was guest speaker at the fall meeting of the Whetstone Valley Medical Society at Millbank, October 25; he discussed heart disease.——Dr. Charles C. Hoagland, Madison, has retired from practice on account of ill health.

WEST VIRGINIA

Society News.—Dr. Irving J. Spear, Baltimore, addressed the Tri-County Medical Society (Harrison, Marion and Monongalia counties) at Clarksburg, October 13, on "Early Diagnosis, Prognosis and Treatment of the Commoner Types of Nervous and Mental Diseases."——Dr. Dean Lewis, Baltimore, President-Elect, American Medical Association, addressed the Ohio County Medical Society, Wheeling, October 19, on "Differential Diagnosis of Some Lesions of the Breast."

GENERAL

Grants Available for Research. — The Committee on Scientific Research of the American Medical Association invites applications for grants of money to aid in research on problems bearing more or less directly on clinical medicine. Preference is given to requests for moderate amounts to meet specific needs. Application forms may be obtained from the committee at 535 North Dearborn Street, Chicago.

Hospitalization of Veterans.—According to Brig. Gen. Frank T. Hines, Administrator of Veterans' Affairs, of some 14,000 admissions of veterans to hospitals during August last, approximately 85 per cent were due to disabilities not of service origin. In October, in hospitals under the direction of the veterans' administration, 60 per cent of the World War group were hospitalized because suffering from conditions not of service origin.

Results of Examinations. — Of seventy-three candidates who took the examination of the American Board of Otolaryngology in Montreal, September 17, sixteen failed or were conditioned. The next examination will be held in Milwaukee, June 12, 1933, during the annual session of the American Medical Association. Prospective applicants for certificates should request application blanks from the secretary of the board, Dr. William P. Wherry, 1500 Medical Arts Building, Omaha, Neb.

Journal of Chemical Physics.—The American Institute of Physics announces a publication to be called the *Journal of Chemical Physics*, to be issued monthly, beginning Jan. 1, 1933. The subjects to be covered will include thermodynamics, solutions, surface phenomena and heterogeneous catalysis, molecular structure, electric moments of molecules, photochemistry, statistical mechanics and crystals. Harold C. Urey, Ph.D., of Columbia University will be the editor. The advisory council is made up of Raymond T. Birge, Ph.D., University of California; Arthur H. Compton, LL.D., University of Chicago; Irving Langmuir, D.Sc., General Electric Company; Gilbert N. Lewis, Ph.D., University of California; Arthur A. Noyes, Sc.D., California Institute of Technology, and John T. Tate, Ph.D., University of Minnesota.

Annual Report of Rockefeller Foundation.—The interest of the Rockefeller Foundation in medical science has shifted since 1929 from medical education to the development of research. According to the annual report for 1931, research projects were sponsored at universities in the United States and foreign countries on the study of virus diseases, puerperal fever, neurology, serology, biochemistry, dental pathology and the common cold. The foundation provided 353 fellowships in the medical sciences. The International Health Division expended $3,096,361.75. Assistance was given in forty-seven countries and in thirty-seven states in the United States in carrying out health programs. Fellowships in public health were awarded to 123 students. The entire appropriations of the foundation for 1931 amounted to $18,737,967.90, of which the largest appropriation was for the social sciences, $5,805,275. The fields in which the foundation carries on its work include, in addition to the medical and social sciences and public health work, the natural sciences and the humanities. The most important element in its program in the social sciences is the development of institutional centers of research, for which $2,165,000 was appropriated in 1931.

Society of Tropical Medicine.—The American Society of Tropical Medicine will hold its annual meeting in Birmingham, Ala., in conjunction with the meeting of the Southern Medical Association, November 16-18. The first session will be held jointly with the southern association, at which Col. Charles F. Craig, New Orleans, will speak on "Diagnosis and Treatment of Amebiasis." At a joint session with the section on public health of the general association, Dr. Daniel M. Molloy, Guatemala, among others, will speak on "Treatment of Hookworm and Other Intestinal Helminth Infections with Hexylresorcinol Under Field Conditions in Central America." At a joint session with the National Malaria Committee, November 18, speakers will include Dr. Paul F. Russell, Manila, P. I., on malaria in the Philippines, and Bruce Mayne of the U. S. Public Health Service, on distribution of mosquitoes for malaria therapy. Among speakers at other sessions will be Dr. Lucius F. Badger, Washington, D. C., on Rocky Mountain spotted fever, and Ernest Carroll Faust, Ph.D., New Orleans, on "Human and Primate Species of Strongyloides." Dr. Frank Smithies, Chicago, will deliver the presidential address at a luncheon, November 17, on "Late and Permanent Effects of Chronic Intestinal Parasitosis on Digestive Function as Observed in Patients Residing in the Temperate Zone."

Southern Medical Association.—The twenty-sixth annual meeting of the Southern Medical Association will be held in Birmingham, Ala., November 15-18, under the presidency of Dr. Lewis J. Moorman, Oklahoma City. The first day will be occupied by a clinical session at which Birmingham physicians will present cases in each of the specialties of medicine. A general session will also be held the second day, for which the following physicians have been announced as speakers, among others:

Lewellys F. Barker, Baltimore, Importance of Multidimensional Diagnosis and Comprehensive Treatment in General Practice.
Arthur C. Christie, Washington, D. C., Diagnosis of Intrathoracic Disease.
Max Cutler, Chicago, Tumors of the Breast: Their Diagnosis and Treatment.
Mont R. Reid, Cincinnati, Blood Supply in the Practice of Medicine and Surgery.
Grandison D. Royston, St. Louis, Rôle of the Cervix in Obstetrics and Gynecology.
Kendall Emerson, New York, Public Health and the Practicing Physician.
Henry W. E. Walther, New Orleans, Urinary Diseases in Pregnancy.
Henry L. Bockus, Philadelphia, Diffuse Hepatitis (Intrahepatic Jaundice).
Esther L. Richards, Baltimore, Medical Aspects of Child Behavior.

Guest speakers who will address the section meetings include the following physicians:

William S. McCann, Rochester, Minn., Use of Protein in Diet.
Elliott P. Joslin, Boston, Diabetes in Children.
George B. Eusterman, Rochester, Minn., The Challenge of the Pancreas.
Burton T. Simpson, Buffalo, Relations of the Pathologist to the Cancer Problem.
Clarence O. Cheney, New York, Psychiatry and the General Practitioner.
Lawrence Reynolds, Detroit, Bone Changes Associated with Parathyroidism.
Frederick D. Weidman, Philadelphia, Identification of Yeast Cells in Histologic Sections.
Philip D. Wilson, Boston, Injuries to the Bones of the Foot.
Jacob P. Greenhill, Chicago, Use of Local Anesthesia in Obstetrics.
Fred H. Albee, New York, Bacteriophage in Treatment of Wounds and Systemic Infections.

Meeting concurrently will be the National Malaria Committee, the American Society of Tropical Medicine, and the southern branches of the American Public Health Association and the Society for Experimental Biology and Medicine.

PHILIPPINE ISLANDS

Personal.—Dr. Francisco Velez, district health officer, was recently elected president of a newly organized medical society in the province of Albay.

Medical Officers Protest Estrada Appointment.—The Medical Department Reserve Lyceum, an organization composed of reserve officers (medical, dental, veterinary and medical-administrative) of the United States Army in the Philippines, has adopted a resolution endorsing the recent protest of the Philippine Islands Medical Association and the Manila Medical Society against the appointment of Dr. Salvador G. Estrada to the Board of Medical Examiners of the Philippine Islands (THE JOURNAL, October 22, p. 1439). In the resolution it is pointed out that Dr. Estrada has violated a fundamental principle of medical ethics by publishing unethical advertisements.

PUERTO RICO

Journal Now Bilingual.—With the September issue the *Puerto Rico Journal of Public Health and Tropical Medicine* adopted a new plan to publish contributions either in Spanish or in English, each article being followed by translations or abstracts in the other language. The object of the change, the journal explains, is to facilitate interchange of ideas with Spanish-speaking countries and to attract to the School of Tropical Medicine of the University of Puerto Rico, of which it is the organ, and to the journal Latin-American members of the medical and scientific professions, both in person and as literary contributors.

LATIN AMERICA

Society News.—Officers of the National Academy of Medicine of Mexico were recently elected as follows: Drs. Tomas G. Perrin, president; Ignacio Chavez, vice president; Alfonso Pruneda, perpetual secretary; Mario A. Torroella, annual secretary, and Ramon Pardo, treasurer.

Child Nutrition Clinic.—The Public Health Service of Guatemala recently opened a maternal hygiene and child nutrition clinic in its office in Guatemala City. Three specialists in gynecology and pediatrics, a graduate nurse and an assistant comprise the staff. While established for the purpose of providing treatment for the sick, one of the primary functions of the clinic will be to teach mothers the proper diet for their children. No charge is made.

Government Services

Army Personals

Col. Lucius L. Hopwood has proceeded to his home to await retirement, for the convenience of the government; Major Bertram F. Duckwall, relieved at Fort Sam Houston, Texas, and assigned to the Panama Canal Department; Major Robert B. Hill, relieved at Fort Riley, Kansas, and assigned to the Philippine Department; Lieut. Harry B. Ditmore will proceed to his home and await retirement, for the convenience of the government; Col. James A. Wilson, on completion of foreign service is assigned to Fort McPherson, Georgia.

Change of Station in the Navy

Lieut. Robert M. Gillett from the fourth regiment, U. S. Marines, Shanghai, to the United States; Lieut. Walter F. J. Karbach from the U. S. S. *Asheville* to the United States; Lieut. John R. Smith from the fourth regiment, U. S. Marines, Shanghai, to the naval hospital, Boston; Lieut. Irving J. Warmolts from the destroyer division, 15 Asiatic, to the receiving ship, New York; Lieut. Ferrell H. Johnson from the U. S. S. *Palos* to the United States; Lieut. Marion J. Eaton, resigned, effective September 30; Lieut. Comdr. Joseph L. Schwartz, from naval station, Tutuila, Samoa, to naval dispensary, San Pedro, Calif.; Lieut. James R. Fulton, from naval hospital, New York, to naval station, Tutuila, Samoa.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 27, 1932.

Tuberculosis in Children

The Medical Research Council has published a report by Dr. John W. S. Blacklock which is an addition to our knowledge of the pathology and bacteriology of tuberculosis in children. He has produced new evidence of the paths of infection, based on a study of primary foci, with identification of the type of bacillus, whether bovine or human. The classic researches of Dr. A. Stanley Griffith of the scientific staff of the Medical Research Council have shown the numerical relations of these two forms. Bovine bacilli cause much abdominal tuberculosis, especially in children under 15, but only a third of the cases of tuberculous meningitis, even before the age of 15, are of bovine origin, and in bone and joint tuberculosis the human type preponderates, while pulmonary tuberculosis is almost invariably of human origin. However, several questions are unsettled. The relative importance of air-borne and food-borne infections is much debated. It is both asserted and denied that pulmonary tuberculosis is primarily an infection of childhood and that it may long remain dormant and present itself as an active disease later, flaring up under the strain of rapid growth, occupation, fatigue or malnutrition. To fill up these gaps in our knowledge, Dr. Blacklock's careful and prolonged studies have been designed.

His investigations were applied to children varying in age from a few months to 13 years, who died in the Royal Hospital for Sick Children, Glasgow, from any cause. In a series of 1,800 necropsies he searched for evidence of tuberculosis and found it. In 283 (15.7 per cent) he found naked-eye evidence of tuberculosis. He isolated and typed the organism in 183 of these cases and in addition in 52 cases of surgical tuberculosis of which none were fatal in the hospital. In the 283 cases, over 90 per cent of the deaths were due to tuberculosis. The primary lesion was most often found in the chest (61.1 per cent), next in the abdomen (35.7 per cent) and least in the cervical glands (2.1 per cent).

THE PATHWAY OF INFECTION

Of the 283 cases showing tuberculous lesions, 173 (61 per cent) were due to primary infection of thoracic tissues (lungs or lymphatic glands). As to the pathway of infection, a great diversity of views have existed. Villemin in 1868 was the first to suggest that pulmonary tuberculosis was due to inhalation of material coughed up, and Koch thought that it was caused almost solely by inhalation of dried pulverized sputum. But in 1903 von Behring suggested that infection occurred in most cases in infancy and that the portal was nearly always the alimentary tract, through the mucous membrane of which the bacilli passed without producing any lesion, eventually settling down in the lungs or bronchial glands, where at once or after a latent period tuberculosis developed when the resistance was lowered. But Blacklock found that the primary lung lesion, described originally by Parrot in 1876, was present in 148 out of 173 pulmonary cases. This consists of a single subpleural patch of bronchopneumonia, usually with a tendency to heal. All the cases showed evidence of caseation and some showed evidence of further changes. Dr. Blacklock therefore concludes that the pathway of infection in these cases was by the air. Whenever this primary lung lesion was found, only bacilli of the human type were obtained either from the lesion itself or from the glands in direct relation to it.

ABDOMINAL TUBERCULOSIS

The primary lesion was found in the abdomen in 35.7 per cent of the cases of tuberculosis. In contrast to pulmonary

tuberculosis, primary abdominal infection was found to be mainly of bovine origin. But there was no support for the view of some authorities, principally continental, that the alimentary tract is the chief pathway for tuberculous infection in the child. Blacklock's results confirm the earlier pioneer work in Edinburgh and show that although the incidence of infection by human bacilli is always higher than that by bovine, bovine tuberculosis is more prevalent in Scotland than in England or on the continent. The greatest number of primary abdominal lesions were found in the second year of life, the period when children consume much raw milk. In the first year of life only one human and no bovine infection was found in babies breast fed for nine months or till death, but in those fed on cow's milk two human and fourteen bovine infections were found. The greatest number of infections with the human type of bacillus in the abdominal cases were found in children aged from 9 to 18 months—the period when they commence to crawl and walk and are liable to pick up infection from the ground and from floors.

THE SIGNIFICANCE OF TUBERCULIN REACTIONS

Blacklock correlated tuberculin reactions with the results of necropsy in one of the most extensive series of cases yet investigated. He confirmed the previous observations of Hart, which were published by the Medical Research Council, that in infants a positive tuberculin reaction is a grave prognostic sign.

High Mortality Among the Scots

The conclusion is drawn that in Scotland nearly all the children with tuberculous lesions in the lungs or tracheobronchial glands die in childhood from the disease. Healed tuberculous tracheobronchial glands were found to be very rare. This conclusion is contrary to the views of American and continental workers. Thus, Armand-Delille and Lestocquoy stated in 1931, as a result of investigating pulmonary tuberculosis in the children of Paris: "Some years ago pulmonary tuberculosis in infants was considered as always fatal, whereas nowadays one is inclined to consider it as nearly always curable." It is difficult to explain this greater mortality among Scotch children, unless the relatively isolated position of the country has given less opportunities for infection in the past and prevented the development of the racial resistance found in other countries. In New York a much higher tuberculosis mortality is found in Scots than in the French, Germans or Russian Jews. The conclusion is drawn that "the Scottish people are less resistant to tuberculous infection than many other civilized races." Other factors—diet, climate and housing conditions—play a part. In Scotland as compared with the continent, there is less sunlight, particularly in the winter months, and the diet of poor children probably contains less foods (vegetables and fats) rich in vitamins A and D.

Rheumatism Costs the Country $100,000,000 a Year

Speaking at the National Association of Insurance Committees, Dr. C. W. Buckley, a member of the committee of the British Medical Association for research into the causes and treatment of arthritis and allied conditions, and senior physician to the Devonshire Hospital for Rheumatic Diseases, said that an investigation by the Ministry of Health showed that rheumatism of all kinds accounted for one sixth of the total benefits paid out of the national health insurance act. The total incapacity due to this disease must now amount to not less than 5,500,000 weeks and the cost exceeded $25,000,000 per annum. This excludes loss of wages and the cost of treatment in hospitals and institutions, which would bring up the whole to something like $100,000,000. This appalling expenditure could be reduced by early diagnosis and prompt treatment, which means organization of research into prevention and the provision of greatly increased facilities for treatment. But chronic arthritis was only beginning to receive proper attention in view of its ravages, especially among the working population. It was so insidious in onset that the sufferer did not give up work until the most favorable stage for treatment was passed. Time was wasted in trying all sorts of nostrums until damage was irreparable. Dr. Buckley's great experience has shown that the poorest are not so much affected as the more prosperous artisan classes, which suggested that want of knowledge was more important than want of means. It is not those who lack clothes but those who are overclothed, not those who are underfed but those who are unsuitably fed, who suffer most. "Many people grumble about the weather and attribute all rheumatism to our climate, but if they made better use of fresh air and would not shut themselves up in stuffy rooms they would be far better able to resist disease of all kind and not rheumatism alone." Medicine played only a secondary part in the treatment of rheumatism. What was wanted was to bring into existence, and within the reach of all, massage, electricity, baths and the like, with specialist advice and research. Acute rheumatism has already been the subject of considerable research, and hospitals and clinics are being established for its treatment, especially by the London County Council. But chronic arthritis is only beginning to receive the attention it deserves in view of its ravages.

PARIS

(From Our Regular Correspondent)

Oct. 12, 1932.

International Congress on Hygiene of the Mediterranean Region

The number of congresses is increasing every year. Medical specialties now want their own particular congress. There have even been meetings for the study of a single disease: the convention on renal lithiasis at Vittel and on biliary lithiasis at Vichy, and, in a few days, the Congress on Rheumatism is to be held. The custom appears to be growing, in scientific circles, of entrusting the solution of important problems to international conferences. The theses of every scientist are known in advance through his articles in medical journals, and discussions among scientists of equal rank never change any one's opinion. The idea of devoting a session to the study of certain problems, which, although widely different, have in common the fact that they concern the shore of the Mediterranean was original. For instance, it was interesting to compare, with reference to melitococcosis, the observations made independently by physicians of Spain, France, Italy, Great Britain, Greece, Turkey, Syria and Egypt. It was likewise of value to make known, to other inhabitants of the shore of the Mediterranean, epidemics that are just lifting their heads, such as Spanish spirochetosis and the exanthematic fever of Marseilles. This congress met in September and was a success, having brought together nearly all the public health officers of the Mediterranean regions. The congress was opened in the new Faculté de médecine de Marseille, by the minister of public health, Mr. Justin Godart, and was brought to a close by Mr. de Monzie, minister of public instruction. Mr. Marchoux, professor at the Institut Pasteur, and president of the congress, outlined diseases to be studied—malaria, bilharziasis, undulant fever, exanthematic typhus, kala-azar, dengue, cholera and the plague. His address constituted a treatise on tropical pathology.

The first paper presented was by Prof. Sadi de Buen, on Spanish spirochetosis, which he was the first to describe, in 1926. It is caused by Treponema hispanicum. The transmitting agent is Ornithodorus erraticus. The pig was the first animal recognized as the reservoir of the virus; but since then the fox, the porcupine and several small rodents have been found to play the same part. The geographic distribution extends throughout Spain and Morocco, while cases have been reported from Dakar and from Tunisia. The disease is a recurrent fever, characterized by violent attacks, the intervals between which

become more and more extended, and which recedes spontaneously in from three to four weeks. The fever is so intense that the virus of this spirochetosis has been employed in connection with pyretotherapeutic treatment in dementia paralytica. The results are generally inferior to those produced by inoculation with malaria.

A study on undulant fever was offered by Mr. Burnet, who enumerated the pathologic organisms that cause the disease. Lisbonne and Vidal presented a paper on undulant fever of bovine origin, in France. The authors showed that undulant fever in France is often of bovine origin and that its causative agent is Brucella melitensis much more often than Brucella abortus. Either organism is likely to provoke the disease; also a third Brucella organism, described by Huddleson, Brucella suis. The cases due to Brucella melitensis are more severe and have an epidemic character. The cases resulting from Brucella abortus are less severe and are usually sporadic. Nevertheless, Lisbonne and Vidal view with alarm the extension of undulant fever in France through Brucella melitensis derived from cattle, in the regions of the West and the East, where there are few goats or sheep and where, until recently, the disease was unknown. The contamination of cows by sheep and goats occupying the same stables is unquestionable. The disease is spreading, chiefly through the migratory herds of goats. Charles Nicolle, who was present, expressed the hope that research on these subjects be henceforth directed toward problems of vaccination and therapeutics.

Mr. Olmer read a paper on Mediterranean exanthematic fever, the first cases of which were reported by him from Marseilles, in 1925. The disease is identical with *fièvre boutonneuse* of Tunisia, and its transmission is brought about by a dog tick (Rhipicephalus sanguineus). It is possible that other animals besides the dog serve as hosts. The disease is capable of assuming variable forms through a sort of progressive adaptation to man.

The fourth paper was supplied by Mr. Blanc, who described dengue, which he observed during the severe epidemic in Athens, a few years ago. He recommended prophylaxis by the combating of stegomyia mosquitoes and the use of preventive vaccination.

Mr. Lutrario, former director general of the public health service of Italy, submitted a paper on the methods of deratization of ships. He assigned first importance to rat proofing, provided the crusade is pursued relentlessly in all ports and in the adjacent territory. The use of toxic vapors is of secondary value. Lutrario did not express his preference for any particular chemicals; the results depend more on the skill of the exterminator. Poisons, viruses and traps are only of third importance. They render service in ships that are infested, by checking the breeding of the rats. Great importance should be attached to creating a crew devoted to the task of deratization. Such men develop through training and experience a remarkable ability in this line of work.

It was decided to send to London a telegram of condolence on the occasion of the death of Sir Ronald Ross, news of which reached the congress while in session.

Honors Bestowed on Mr. Tuck

The municipal council of Paris, bestowed, three months ago, on Mr. Tuck, an American citizen who has resided near Paris for many years, the title of honorary citizen of Paris, a title rarely accorded, there being at the present time fewer than ten persons who have been so honored. The municipal council desired thus to recognize the generosity of Mr. and Mrs. Tuck (the latter now deceased) so frequently shown in the founding of hospitals, the performance of charitable work and magnificent donations of art objects to the museums. The official presentation of the parchment conferring this title took place at the Hôtel-de-Ville in Paris. Addresses were delivered by Mr. Renard, prefect of the department of the Seine, and by Mr. de Fontenay, president of the municipal council. In a few words, Mr. Tuck said that he was proud to receive a title that had been borne by so illustrious a compatriot as Benjamin Franklin.

BERLIN

(From Our Regular Correspondent)

Oct. 10, 1932.

The German Medical Federations

The federations of German physicians, the Deutscher Aerztevereinsbund and the Hartmannbund, met recently in Hanover. Owing to economic conditions, only a session of the executive committee had been appointed as a substitution for the general medical congress usually held annually. The so-called Hartmannbund, which deals with purely economic questions and those of a syndical nature, held previously a two-day meeting, which was attended by about 500 delegates and physicians. The principal subject for discussion was "Das neue Aerzterecht," by which legal matters affecting physicians and *krankenkassen* are not only regulated but given a form that presents certain advantages for physicians, although from the financial standpoint it is defective. This is the largest economic organization of a liberal academic profession, including nearly all German physicians. Its chief task concerns the service that physicians perform for the promotion of public health and their cooperation in all fields of health work and social medical aid. This task is impossible unless the medical profession retains its freedom. Since the federation was founded, the chief demand of physicians has been the securing of the free choice of physicians, for which they have waged a bitter fight for the past quarter century. Within the past year, they have obtained all the essential points of their demands. The absolute freedom and the rights of defense of the medical federation have been recognized and assured. But this victory was bought with heavy sacrifice by individual physicians. While the increase in panel physicians to one physician to each 600 members of a *krankenkasse*, whereas formerly it was 1 : 1,000, contributes toward the solution of the unemployment problem in the profession without imposing on the sick benefit organizations any additional pecuniary burdens, the large reduction in the income of a physician is a sacrifice, made greater because he must provide from his income also for old age, disability and surviving members of his family. The number of medical students at the German universities at present is 25,000, a number which would cover for many years Germany's need of new physicians. The new regulations have reduced the working area of the panel physicians, while the paper work has been increased and the compensation has diminished greatly. The reduction in the physician's income, reckoned according to percentage, is much greater than in any one of the liberal professions. The income of a large portion of physicians will not equal the minimum required for the practice of their profession. It is no wonder that physicians criticize the new regulations. But it must not be forgotten that a large part of the reduction is due to the present economic conditions. In times like these, the individual must often sacrifice for the common good, and the physician will never forget that it is his noble task to serve in the promotion of public health. Individual physicians will never be able to act in harmony with physicians who are opponents of the attained uniform medical system because they are advocates of an absolute system of state medicine or because they, as opponents of social insurance in general, condemn all sick benefit associations. The organized medical profession has not forgotten that a system of social insurance for the working population is, within reason, a government necessity. If the government and the leagues of the *krankenkassen* want peace, the path is clear for mutual activity in the service of social insurance. Hence, the German medical profession supports a

reasonable system of social insurance and is eager to collaborate in its development. But there are still in this field many important matters to be regulated.

Today, the improvement of the health of the German people rests heavily on the heart of the medical profession. It gives its full approval to the recent declaration of Lord Dawson of Penn, of the British Medical Association, that in the future the chief task of the physician will no longer be the healing but the prevention of disease. It may be emphasized further that, while continuing to manifest interest in all current matters of organization, in the future questions pertaining to eugenics will demand more attention on the part of physicians. The task will be to promote the health of the German people, to preserve its best hereditary qualities, and to check the growth of the masses displaying inferior hereditary qualities. In this field, research has made great progress, having discovered many "laws" of heredity. At the instance of the Aerztevereinsbund, four competent representatives were selected to sift the available scientific material and to present conclusions. Discussion of these essentials occupied a large part of the session. The reports of these leaders resulted in the approval of the following conclusions:

The spread of the knowledge of heredity and of the principles of life through a better training of physicians in eugenics and by the enlightenment of the whole people must, in view of a rapidly declining birth rate, be promoted with all possible energy. A taxing policy based on eugenic points of view and back-to-the-farm movements on a large scale constitute important means for the securing of adequate posterity possessing sound hereditary physical and mental traits.

A decisive change in the economic position of women will make it possible to restore the German housewife to her proper position in society as wife and as mother of children with sturdy hereditary qualities.

In addition to these measures there is an unavoidable need of preventing the hereditary transmission of pathologic tendencies. The surest means to that end is the sterilization of the bearers of hereditary taints. The experimental facts developed through observation of the workings of heredity make possible in certain cases a reliable hereditary prognosis, so that prevention through sterilization has now a firmer foundation than formerly. But the serious import of this intervention, which deprives persons of the capacity of producing offspring, permits its application only under the most carefully controlled conditions. Legislation to be adopted soon should be based on the following principles:

Sterilization may not be performed without the consent of the subject and then only when a federal court, with the aid of experts, has decided it is just. In the case of married couples, the intervention may be applied only to the spouse having hereditary defects.

Sterilization based solely on economic considerations must be rejected from the medical point of view, because it deprives healthy persons of the capacity of producing offspring and thus diminishes the total mass of valuable (potential) hereditary possessions of our people. It will be the duty of the Deutscher Aerztetag, to be held in 1933, to present the results of these deliberations to the medical profession of Germany for their consideration.

A New Form of Charlatanism

That charlatanism flourishes in Germany has been repeatedly brought out in these letters. Here are two further examples: In a large emporium, located in the best part of the city, an apparatus for the recording of weight, with the usual table "What You Should Weigh," bears in addition the statement: "Scale with special apparatus for recording the heart beat" and the further lure "Attention; how is your heart working?" Nearby stands a barker—wearing of course a white overgarment—who informs passers-by that for only 10 pfennigs they can learn whether their heart is working regularly or whether it is affected by nervous symptoms. He explains further that numerous physicians have endorsed this method. This charlatanism, which does not fit in with the legitimate tasks of an emporium, should be suppressed. It is also stated that at one of the market places in Berlin an "expert" is offering for the small sum of 50 pfennings to test the blood pressure of all comers. This reminds one of the activity of a large mail order house in the United States, which as a secondary business venture, was offering to furnish customers, for a nominal sum, a urinalysis, a plan which was suppressed through the action of the American Medical Association, as reported recently in THE JOURNAL.

Health of School Children in Berlin

In 1930, in the grade schools of Berlin, 69,489 boys and 67,573 girls were examined periodically by the school inspection service, and in the higher schools 17,264 males and 14,208 females. According to reports published in the Statistical Yearbook of the city of Berlin for 1932, the results of these examinations were as follows: In the grade schools, the physical condition was good in 29.3 per cent of the boys and in 37.4 per cent of the girls; the physical condition was fair in 55.9 per cent of the boys and in 50.2 per cent of the girls. The physical condition was bad in 14.8 per cent of the boys and in 12.4 per cent of the girls. In the higher schools, the physical condition was good in 42.0 per cent of the boys, fair in 50.5 per cent and bad in 7.5 per cent. The physical condition was good in 50.1 per cent of the girls, fair in 43.4 per cent and bad in 6.5 per cent. It would be interesting, if possible, to compare these figures with the figures for recent months; but, unfortunately, it takes some time to collect and compute worth-while statistics.

The Number of War Injured in Germany

According to the census of persons entitled to social aid, as taken in May, 1932, the number of war injured and war dependents in Germany entitled to aid was 820,000, as compared with 838,000 in May, 1931.

"Welfare Practice"

Between the municipal authorities and the Aerztebund (league of physicians) of Greater Berlin a contract has been drawn up that will regulate the medical care to be given "welfare patients." By "welfare patients" is meant persons who have been unemployed beyond the limit of time set for the drawing of unemployment benefits from their *krankenkasse* and who are now dependent on the small allowance granted by the welfare organizations. As in the past, all physicians who desire to accept "welfare patients" may do so, although the remuneration now consists in an annual flat rate of 8.75 marks ($2.08) per patient, whereas formerly the remuneration was based on the Prussian fee schedule. As in the *krankenkassen*, physicians are obliged to keep within certain limits in prescribing remedies. If physicians fail to meet their obligations in accordance with the terms of their contract, a complaint can be filed against them and if, after trial in a regular complaint action, they are found guilty, the penalty may be a warning, a rebuke, the imposition of a fine not to exceed 300 marks ($71.40), or temporary or permanent exclusion from welfare practice.

Testing the Acuteness of Vision

In a series of papers published by the Königsberger Gelehrtengesellschaft, Prof. Dr. Arthur Birch-Hirschfeld, director of the Eye Clinic of the University of Königsberg, contributed one on "A New Method for the Testing of Vision." Whereas the usual method of testing vision is to use a light of constant brightness, Professor Birch-Hirschfeld starts with the assumption that the previous method was defective because the varying

acuteness of vision in different degrees of illumination was not tested. He substitutes a method in which the functioning of the eye is tested in varying degrees of illumination, and curves are plotted that reveal that five types may be distinguished into which the functioning of the healthy human eye can be divided. He found that, in old age, acuteness of vision may be preserved, although a considerable increase in the degree of brightness of the light used may be necessary to secure the same result as is secured by younger persons. The experiments made thus far include only a hundred cases. Further research must be done before it can be decided whether the new method will bring about a change in the mode of testing vision.

ITALY

(From Our Regular Correspondent)

Sept. 15, 1932.

International Congress of Physiology

The fourteenth International Congress of Physiology, which was attended by representatives of thirty-seven countries, was held in Rome, August 29-September 3. Prof. Filippo Bottazzi, of the University of Naples, was chairman of the committee on organization. Professor Visco of Rome was the general secretary.

The opening session, held in Campidoglio, was attended by the head of the government. Addresses were delivered by Professor Herlikza of Turin, in the name of the Società italiana di biologia sperimentale, and by Professor Bottazzi. Professor Hill, of the University of London, presented the official paper on "Production of Heat in Muscles and in Nerves, in the State of Repose and During Functional Activity." The speaker stated that he was led to undertake researches on this subject through a suggestion made by Langley and in consequence of the results secured by Fletcher and Hopkins in their studies on the metabolism of the muscles. Since 1910, he had been endeavoring to explain the exchanges of energy that take place in the muscle and to understand the restoration process that follows work. Not until 1926 did it prove possible to measure also the production of heat in the nerves. He found that likewise in the nerves there was manifested a restoration process, which has been the principal object of his researches. He had to overcome enormous difficulties in order to make the known physical agents sufficiently sensitive to make use of them in determining such small quantities of heat as developed in the muscles and, particularly, in the nerves. The initial heat that develops in a nerve while it is traversed by an impulse is only the four thousandth part of the initial heat produced by a muscle that completes a contraction. There is no consistent theory concerning the mechanism of nervous and muscular activity. However, there have been observed certain regularities in the chemical and thermic changes, in the molecular organization, in the restoration process following the activity, and in the electrical properties. The work of the congress was carried on simultaneously in five separate sections, in each of which topics bearing on the physiology of the nervous system and respiration, chemical biology, and physical chemistry as affecting biology, were treated.

Professor Henderson of New Haven spoke on chemical control of respiration and on the practical applications of inhalations of carbon dioxide in cases of asphyxia due to carbon monoxide, asphyxia of the new-born, or after prolonged anesthesia.

Professors Danielopolu and Marcu of Bucharest discussed their work on the bronchi. They found an evident antagonism between the vagus and the sympathetic nerves with respect to the innervation of the bronchi, the bronchoconstrictive fibers predominating in the vagus and the bronchodilative fibers in the sympathetic nerve.

Professor Quagliarello of Naples spoke on the lipase found in adipose tissue, of the existence of which he gave an experimental demonstration. Professor Abderhalden of Halle spoke on the progress of research on defense ferments. He isolated a protease that is not demonstrable by ordinary methods and that must be differentiated from other known proteases, such as pepsin and trypsin. He discovered also in the animal organism a defense ferment capable of splitting disaccharides.

Professor Kas of Tokyo demonstrated that it is possible, in the histologic examination of the nerve, to differentiate the inhibitory from the stimulative fibers in reflex phenomena.

Professor Pavlov of Leningrad reported to the congress, in plenary assembly, the results of his recent research on conditioned reflexes. At the suggestion of Pavlov, Soviet Russia was selected as the country in which the next International Congress of Physiology will be held (in 1935).

Hemorrhagic Diathesis in Relation to Tuberculosis

Professor Barberi of the Accademia Pugliese di scienze observed three chronic cases of Werlhof's disease, or purpura haemorrhagica, in tuberculous children, and another case in a girl aged 2, in which repeated hemoptysis preceded by several months the discovery of specific pulmonary lesions. He took the occasion to study in sixty-five tuberculous children the signs commonly considered as indicative of hemorrhagic diathesis. Barberi discovered that the signs of abnormal vasal fragility are observed with about the same frequency as those referable to changes in the composition of the blood. His observations appear, therefore, to indicate that tuberculosis is not to be regarded as merely an occasional factor in the pathogenesis of chronic Werlhof's disease; they serve also to confirm the theory that attributes a hematogenic base to many cases in which the persistent hemoptysis is disproportionate to the local anatomic lesions.

A Case of Madura Foot, or Mycetoma Pedis

Professor De Nunno had recently an opportunity to observe a case of Madura foot, or mycetoma pedis, on which he made a report to the Accademia di scienze medico-chirurgiche in Naples. This disease is rare in Italy. The case observed by De Nunno occurred in a peasant at Molise in whom an infiltration the size of a pigeon's egg suddenly developed, which finally suppurated. Later, small nodules appeared on the malleoli and on the back of the foot. From the nodules, which suppurated, issued a brownish, puslike fluid, and fistulous tracts developed. In a roentgenogram the bones of the foot appeared opaque and somewhat enlarged.

Histologic examination of pieces of tissue revealed the presence of eosinophil and plasma cells, newly formed blood vessels and giant cells. Characteristic is the state of hemosiderosis, with hemorrhagic points and vasal changes of the tunica media, not only of the veins but also of the arteries. Within these tissues was found the mycelium with its filaments, and at certain points masses with granulomatous proliferations. The isolated mycelium develops spores and forms colonies on dextrose agar, of the mamelonated type, which, after a time, take on a brownish gray tint. It is an aerobic micro-organism that emits a pungent, earthy odor.

In the case observed, De Nunno believes that the disease was contracted in Molise, or at least in Italy, although the patient had been in America fourteen years previously.

Vaccine Treatment of Secondary Infections in Trachoma

Professor Ruata presented some new ideas on the etiology and the treatment of trachoma, which are based on two facts that the speaker observed in Egypt. The first is that genuine trachoma (exempt from secondary infections) has a benign course, with clinical manifestations so slight that sometimes they pass unobserved. This benign form is with difficulty differentiated from simple follicular conjunctivitis and is similar to the so-called pretrachoma of the "school" of Angelucci. It heals spontaneously in 30 per cent of the cases. The second

fact observed by Ruata is that in Egypt, where 98 per cent of the population is affected with trachoma, the disease almost disappears in winter, whereas in summer it becomes epidemic along with other eye infections. These are dominated by the Koch-Weeks bacillus, the Morax bacillus and the gonococcus but are also associated with a mixed ocular flora, which in the summer season acquires an exceptional vitality. These secondary infections are an important factor in the etiology of trachoma, which accordingly appears to be based on two factors: a substratum, which, in the opinion of some authorities, is of constitutional origin, and a supplementary factor represented by secondary infections. These have a precipitating action, while the first factor has only a preparatory action. In the treatment of trachoma, Ruata rids the eye of the secondary infections. With that object in view, he experimented with a polyvalent vaccine prepared from various species of bacteria isolated from trachomatous secretions. The vaccine is directed against all the forms of ocular infection and consequently also against trachoma. Of sixty-eight cases in which the speaker applied this method of treatment, he obtained a clinical recovery in fifty-five, or 80 per cent. He was able to establish a local preventive immunity by means of simple ocular injections of ophthalmovaccine on three consecutive days. This immunity was found to be still present twenty days after the accomplished immunization. Preventive vaccination against the secondary infections of trachoma, calculated to protect trachoma patients against recurrences, is being tried in several institutions.

PRAGUE

(From Our Regular Correspondent)

Sept. 27, 1932.

Transportation of Patients to Rural Hospitals

Care of the sick is an important problem in rural Czechoslovakia. The tendency is to build large hospitals with specialized services rather than to scatter hospital beds among small institutions all over the country. The access of patients to hospitals is a problem which has two factors: the investment for an ambulance and its maintenance. The Red Cross has approached a solution of this problem. Through its initiative, the ministry of national defense placed at the disposal of the Red Cross 159 motor military ambulances on condition that the cars should be operated to transport the sick to the hospitals. This arrangement proved to be beneficial. The cars are kept in good order without any expense to the army. According to the report for 1931, recently published, about 75,000 trips to hospitals by local branches of the Red Cross were made. Although a good deal of the transportation cost is paid by the patients in full or at a reduction, many trips are made without any charge whatever. This measure made it possible for many indigent people to get to the hospital. According to present laws, all those who are without means are entitled to free treatment in public hospitals, but the law does not include transportation. The cost of transportation caused many patients to avoid hospitals. Many times, the beginning of a typhoid epidemic could not be detected in an early stage, because the people concealed the disease to avoid paying transportation to the hospital. Operation of the cars is entrusted to a private organization affiliated with the Red Cross (called Samaritans), through whose connection with the voluntary fire brigades it was possible to extend quickly the organization all over Czechoslovakia.

Sickness Insurance

The report of the medical controlling committee of sickness insurance for private employees in Czechoslovakia, recently published, shows the development of a new enterprise in the practice of sickness insurance. Up to the present, the organization of the medical service in sickness insurance has been entirely in the hands of the lay organization, by which the control of the accounts of physicians was made also by officials paid by the sickness insurance bodies. The physicians had many causes for grievance. They were not satisfied with the adjustment of their accounts, which was often done with no understanding for the actual work of the physician. It was considered a great advance when an agreement was reached between the medical organization and the insurance body for the control of medical accounts by a medical committee. A special bureau under medical control has been established, to which the physicians' accounts are sent. Charges for the services of physicians in the insurance scheme amount to about 30 per cent of the whole expense of the insurance body. This report shows a tendency which is manifest in all branches of sickness insurance in Czechoslovakia. The physicians try to obtain from the insurance bodies lump sums proportionate to the financial condition of the insurance body and they attempt to organize the medical service themselves in order to eliminate the interference of the lay element in insurance practice.

Rockefeller Foundation Aids School in Prague

Negotiations for the organization of a school for public health nurses in Prague have been completed. It was difficult to formulate a program of instruction of such a school which would satisfy all the parties concerned. There are two categories of visiting personnel employed in Czechoslovakian dispensaries: one consists of graduates of the school of social work of Prague; the other, graduates of nursing schools. Both schools have a curriculum with a duration of about two years, but neither fills entirely the need for which visiting personnel is employed in dispensaries. Social workers have a tendency to concentrate on office work and to neglect to go out among the families, while the nurses do not have an understanding of social problems, which are closely interwoven with the public health. The construction of the new school is to start immediately and is to open in 1934. The preliminary education required for admission is to be graduation from a secondary school. Training in bedside nursing will be included in the two years course as well as a knowledge of social legislation applicable to field work. Half the cost of the construction of the school was promised to the Czechoslovakian government by the Rockefeller Foundation. The school will be erected on the grounds of the state institute of public hygiene in Prague. Bedside nursing will be practiced in the nearby state hospital. Another feature of the school is that it will be for pupils both of the Czech and of the German language. The practical training in the field will be done for the Czech candidates in one of the demonstration districts of Prague, the one for German candidates in a demonstration district in northern Bohemia. The school will accommodate 100 pupils in its dormitory. It is hoped that the school will create a type of field worker having the advantages of a trained nurse and at the same time knowledge necessary to understand social problems.

Compensation for Industrial Diseases

A law for the compensation of industrial diseases became effective, July 1. Workmen's compensation for accidents has existed in Czechoslovakia since 1887. Compensation for industrial diseases was given under this law only on condition that the sudden appearance of symptoms made it possible to classify them as accidents. The new law includes chronic industrial diseases under the same terms as accidents. There are twenty-five industrial diseases now on the list, and the government may add others. On the list are, first, industrial poisonings (lead, phosphorus, mercury, arsenic, manganese, benzene, carbon sulphide, carbon-hydrogen, phosgene, carbon monoxide, hydrocyanic acid); then a number of chemical substances (chiefly tar products) are enumerated that cause chronic eczemas and malignant growths of the skin. Compensation for pathologic results of irradiation with x-rays and radium will be given. The list contains also cancer of the lungs, so frequently

found in the mines of Joachimsthal. Infectious diseases resulting from occupation are on the list, especially anthrax, glanders and hookworm. Another group of compensable diseases are the chronic changes in the bones and joints as the result of pneumatic drills and hammers. The most important group, however, is silicosis and siderosis. In the same group belongs the damage done to the lungs by Thomas artificial fertilizer. The last group comprises nystagmus and deafness as a result of working in the mines. Compensation will be granted only to workmen who are already employed in industries under accident insurance. Industrial diseases occurring in other industries are not compensable. A case of industrial disease which falls under this law will be treated for twenty-six weeks by the sickness insurance body and then the patient will be notified to the accident insurance, which may then direct the treatment necessary. The accident insurance body has the right also to give a temporary pension to a patient who is willing to change his occupation.

Death of Otto Schulz

Prof. Otto Schulz, an internationally known orthopedic surgeon, is dead. He was born in Bohemia in 1879 and was educated in Vienna. He came to Prague in 1919 and soon became connected with the medical faculty. Besides his teaching activities, he was chief surgeon of the Provincial Institute for the Education of Crippled Children. He was the author of more than fifty scientific publications concerning orthopedic surgical technic. He was an honorary member of the French and Belgian orthopedic societies and a connoisseur in the fine arts.

BELGIUM

(From Our Regular Correspondent)

Sept. 13, 1932.

Diplomas for Specialists

The question of diplomas for specialists is still far from a solution. One of the advocates of such diplomas has just published a study on the subject, from which the following abstract has been taken:

If a diploma for specialists is to be considered, it must be recognized from the start that the privileges of the holder of a diploma of a doctor of medicine, surgery and obstetrics shall remain full and complete. The physician must retain the right to practice all the branches of the art of healing. But the medical sciences have grown so that it is impossible for one brain to encompass all the branches of medicine. The title itself of doctor of medicine, surgery and obstetrics is an anachronism and may easily lead to abuses. The physician is, however, always subject to the restraint of his medical conscience, which is by no means vain.

The Royal Academy of Medicine has devoted considerable study to and is still discussing the creation of diplomas for specialists. It has appointed a committee, composed of members of the various sections of medicine and surgery, to draft concrete proposals, which, after consideration by the general assembly, will be presented to the government.

When the student completes his medical studies, he has already made heavy sacrifices in time and money, and one can impose no more on him. However, one cannot prevent certain graduates from going further. That is what the majority of the specialists have done on their own initiative, going, for example, for postgraduate study to large foreign clinics; but that does not suffice.

The measures that are being proposed today are motivated by certain dangers that beset the medical profession, one of which is social insurance. The economic and political crisis protects us, for the time being, against this menace, but it will reappear as soon as conditions have become normal again. The form that has been proposed in Belgium is not exactly state medicine, as in Germany and in France; for it is planned to have the social insurance system function with the aid of the mutual benefit associations. These associations, in Belgium, are unfortunately political organizations, and they present all the disadvantages of such organizations. These mutual benefit associations will be the recipients of large subsidies. Some estimates place the amount of the subsidies as high as a billion and a half. These formidable organizations will become the masters not only of their members but also of the physicians. They will establish hospitals, clinics and dispensaries, and herein lies a danger from the standpoint of medical education: In the university cities, the clientele of the hospital services, composed in great part of workmen, will be compelled to patronize institutions controlled by the mutual benefit associations, and the university hospitals might as well close their doors. Another danger lies in the fact that the mutual benefit associations are encumbered with all the disadvantages and all the embarrassments of political organizations. Then, again, if they establish hospitals, whom are they going to put at the head of them? It is at this point that the danger arises, and there is likely to come an era of poorly qualified institutional directors. The Academy of Medicine fears such complications.

During the discussions that arose in the academy in connection with the study of this question, Professor Nolf suggested that the present title of doctor of medicine might be replaced by some such title as doctor of medical sciences, or, following the practice in the Netherlands, two titles, one of a superior rank, might be recognized. The academy did not endorse either of these suggestions, but it approved the idea of creating diplomas for specialties: specialties in internal medicine and in several of the branches of medicine pertaining thereto, and specialties in general surgery and in several branches of medicine associated therewith: obstetrics, urology and the like.

With regard to general surgery, the academy held that an applicant for a diploma in this specialty should spend full time for four years (or six years part time) in the surgical department of a university hospital, or somewhere in a foreign country in a surgical department of equal standing. On completion of such study, a certificate setting forth the nature of the work done would be secured from the head of the surgical department, and as a supplementary requirement an operation would be performed before a board of five members—three chosen from the faculty of medicine in which the applicant is enrolled, the head of the department in which the postgraduate work is done, and the head of a medical department outside of the university. In addition, the discussion of some subject either chosen by the candidate or assigned by the board might be required. Two failures would imply a definitive rejection.

A physician who had practiced for a long period of years might be permitted to present himself for examination without taking a special course.

A specialist's diploma acquired in such a manner would give to the holder an unquestionable authority before the public.

With reference to the subdivisions of the two main specialties, internal medicine and surgery, the academy thinks that it is advisable to hold to the specialties (seven or eight in number) recognized by the law pertaining to higher instruction. It would be, indeed, impossible to establish diplomas for all the specialties that have arisen in recent years, from thirty to thirty-five in number. The academy thinks also that for the specialties of a more technical character the postgraduate course of training need not be so long; two years of full time would be sufficient.

The academy holds further that, once the principle is accepted, the public authorities should decree that only candidates provided with a specialty diploma will be considered for the post of department head in the clinical hospitals and the dispensaries attached. In this manner, an élite body of specialists will be created; abuses will be prevented, and the standards of the medical profession will be raised.

Marriages

NATHAN E. BEAR, Monroe, Wis., to Miss Ellen Topel Trautman of Sheboygan, in Chicago, October 15.

PHILIP BARTOW BEDINGFIELD, Wrightsville, Ga., to Miss Evie Smith of Dublin, October 14.

EDWIN W. DYAR, JR., Ossian, Ind., to Miss Florence Waterfall of Columbia City, August 20.

CLIFFORD A. H. FRATZKE, Waterloo, Iowa, to Miss Fern J. Dodd of Traer, August 27.

LESTER JOHN BAYER, Merrill, Wis., to Miss Gertrude Smith, September 1.

DAVID S. BRACHMAN to Miss Miriam Levin, both of Detroit, September 8.

Deaths

Ray **Clinton Stone** ⊕ Battle Creek, Mich.; Detroit College of Medicine, 1904; past president and councilor of the Michigan State Medical Society; formerly member of the Michigan State Board of Registration in Medicine; served during the World War; fellow of the American College of Surgeons; attending surgeon to the Leila Y. Post Montgomery Hospital and chief surgeon to the Nichols Memorial Hospital; aged 53; died, October 31, of an accidental gunshot wound sustained while on a hunting trip.

Samuel Judd Holmes, Seattle; Rush Medical College, Chicago, 1876; Medical Department of the University of the City of New York, 1877; member of the Washington State Medical Association; formerly lecturer on pathologic anatomy and pathologic histology, Rush Medical College; past president of the King County Medical Society; formerly member of the city board of health; aged 77; died, August 15, of pneumonia and arthritis.

Richard Frank Seidensticker, Brooklyn; Yale University School of Medicine, New Haven, Conn., 1911; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; served during the World War; assistant surgeon to the Methodist Episcopal Hospital; member of the courtesy staff, St. John's and Prospect Heights hospitals; aged 48; died, October 9, of carcinoma of the rectum.

Leon Clifford McAmis, San Diego, Calif.; Medical Department of Washington University, St. Louis, 1905; served during the World War; fellow of the American College of Surgeons; aged 54; formerly on the staffs of the San Diego County Hospital, the Scripps Memorial Hospital and the Mercy Hospital, where he died, September 23, of bilateral pulmonary tuberculosis.

John Guilford Earnest, Atlanta, Ga.; Jefferson Medical College of Philadelphia, 1867; member of the Medical Association of Georgia; emeritus professor of clinical gynecology, Emory University School of Medicine; fellow of the American College of Surgeons; Confederate veteran; formerly on the staff of St. Joseph's Infirmary; aged 90; died, October 10.

Marion Oley Biggs ⊕ Louisiana, Mo.; Hospital College of Medicine, Louisville, Ky., 1892; member of the American Psychiatric Association; formerly superintendent of State Hospital No. 1, Fulton; aged 62; died, October 23, in the Pike County Hospital, of a skull fracture received when he was struck by an automobile.

Percy Gillette Cornish ⊕ Albuquerque, N. M.; Jefferson Medical College of Philadelphia, 1885; fellow of the American College of Surgeons; attending surgeon to St. Joseph's Sanatorium and Hospital and the Southwestern Presbyterian Hospital; aged 75; died, September 28, in Los Angeles.

Albert M. Hoover, Parkers Landing, Pa.; Cleveland Medical College, 1870; Jefferson Medical College of Philadelphia, 1874; member of the Medical Society of the State of Pennsylvania; also a druggist; Civil War veteran; aged 87; died, September 4, of abscess of the throat.

Philip Dibble Bunce ⊕ Hartford, Conn.; College of Physicians and Surgeons in the City of New York, 1891; served during the World War; formerly police surgeon; on the staff of the Hartford Hospital; aged 68; died, September 13, of carcinoma of the prostate.

Levi Tarr Gilbert, Scottsdale, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1896; member of the Medical Society of the State of Pennsylvania; on the staff of the Mount Pleasant (Pa.) Memorial Hospital; aged 67; died, September 8, of angina pectoris.

Samuel M. Eash, Shipshewana, Ind.; Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1888; aged 68; died, October 12, in the Elkhart (Ind.) General Hospital, following an operation for inflammation of the pancreas.

Eugene M. Shepherd ⊕ Nashville, Tenn.; Eclectic Medical Institute, Cincinnati, 1895; medical director of the Life and Casualty Insurance Company; aged 58; died, September 30, in the Vanderbilt Hospital, of acute secondary hemorrhage, following craniotomy.

James I. Hathaway, Carrollton, Ohio; Medical Department of Western Reserve University, Cleveland, 1902; formerly member of the county board of health, coroner and county health officer; aged 61; died, October 4, of cardiorenal vascular disease.

George Lancaster Brown, Fort Hunter, Pa.; Baltimore Medical College, 1894; member of the Medical Society of the State of Pennsylvania; bank president; aged 66; died, September 25, in the Harrisburg Polyclinic Hospital, of cerebral hemorrhage.

Victor Lehmann, Norco, La.; Medical Department of the Tulane University of Louisiana, New Orleans, 1889; member of the Louisiana State Medical Society; formerly coroner of St. Charles parish; aged 82; died, September 11, of chronic myocarditis.

Eugene Laurence Hartigan, Chicago; Northwestern University Medical School, Chicago, 1909; also a lawyer; for many years assistant police surgeon; aged 50; died, October 28, in the Mercy Hospital, of ruptured gastric ulcer and aspiration pneumonia.

Michael Edward Nolan, Johnstown, N. Y.; Albany (N. Y.) Medical College, 1913; member of the Medical Society of the State of New York; served during the World War; aged 45; died suddenly, September 22, in the Albany Hospital.

Samuel James Tildon Darden, Myrtle, Miss.; Memphis (Tenn.) Hospital Medical College, 1909; member of the Mississippi State Medical Association; formerly county health officer; aged 56; died, October 5, in a hospital at New Albany.

Augustus Korndoerfer, Jr., Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1896; aged 59; on the staff of the Hahnemann Hospital and the St. Luke's and Children's Hospital, where he died, September 17.

Fred Roscoe Hedges ⊕ Everett, Wash.; University of Oregon Medical School, Portland, 1900; fellow of the American College of Surgeons; on the staffs of the Providence and Everett General hospitals; aged 55; died, August 10.

Charles Peter Gieraltowski, Chicago; Illinois Medical College, Chicago, 1905; member of the Illinois State Medical Society; served during the World War; aged 59; died, October 12, of bronchogenic carcinoma of the right lung.

Malcolm Gray Millar, Madison, Wis.; University of Wisconsin Medical School, Madison, 1928; on the staff of the State of Wisconsin General Hospital; aged 29; died, October 11, of hypernephroma of the right kidney.

John Speer Donaldson, Pittsburgh; Jefferson Medical College of Philadelphia, 1896; member of the Medical Society of the State of Pennsylvania; aged 62; died, October 5, of cardiovascular disease with hypertension.

Floyd S. Suddarth ⊕ Grafton, W. Va.; University of Virginia Department of Medicine, Charlottesville, 1897; for two years president of the board of education; formerly state senator; aged 61; died, October 13.

Tenison Deane, Woodland, Calif.; Cooper Medical College, San Francisco, 1888; member of the California Medical Association; aged 66; died, September 1, in the Stanford University Hospital, San Francisco.

Henry Floyd Gamble, Charleston, W. Va.; Yale University School of Medicine, New Haven, 1891; aged 70; was killed, September 7, when the automobile in which he was driving was struck by a train.

Madison Templeton Thurber, Boston; Dartmouth Medical School, Hanover, N. H., 1890; member of the Massachusetts Medical Society and the New Hampshire Medical Society; aged 66; died, September 27.

Charles Theodore Hepp, Brooklyn; Long Island College Hospital, Brooklyn, 1882; member of the Medical Society of

the State of New York; aged 71; died, October 13, in the Wyckoff Heights Hospital.

William A. Wellemeyer, Vassar, Mich.; Chicago Homeopathic Medical College, 1900; member of the Michigan State Medical Society; aged 55; died suddenly, September 15, of intracranial hemorrhage.

Edmund Backe, Kenyon, Minn.; King Fredericks University Faculty of Medicine, Oslo, Norway, 1887; member of the Minnesota State Medical Association; aged 68; died, June 3, of arteriosclerosis.

Lyda E. Hillyard, St. Joseph, Mo.; Central Medical College of St. Joseph, 1905; member of the Missouri State Medical Association; aged 57; died, August 31, of cerebral hemorrhage.

William J. Durant, Rolla, Mo.; University of Michigan Medical School, Ann Arbor, 1902; member of the Missouri State Medical Association; aged 64; died, October 5, of cerebral hemorrhage.

James Murray Ellzey ✠ Philadelphia; Medical College of Virginia, Richmond, 1896; aged 60; on the staff of the Chestnut Hill Hospital, where he died, October 21, of cerebral hemorrhage.

Elwin Mather Brown, Tacoma, Wash.; University of Illinois College of Medicine, Chicago, 1911; aged 48; died, September 26, in the Tacoma General Hospital, of pyelonephritis.

Nathaniel Adair Kidd, Ellis, Kan.; University Medical College of Kansas City, Mo., 1909; aged 43; died, August 16, in St. Anthony's Hospital, Hays, of acute nephritis and myocarditis.

Rufus Jackson Griffin, Moundville, Ala.; Medical College of Alabama, Mobile, 1890; member of the Medical Association of the State of Alabama; aged 63; died, October 2, of pneumonia.

Joseph M. Bulla, Elizabeth City, N. C.; Pulte Medical College, Cincinnati, 1888; formerly coroner of Wayne County, Ind., and health officer; aged 74; died, October 10, of pneumonia.

Page Brown, Los Angeles; Jefferson Medical College of Philadelphia, 1879; member of the California Medical Association; aged 77; died, September 28, of acute coronary occlusion.

James Lenox Mayon, Santa Cruz, Calif.; Medical College of the Pacific, San Francisco, 1879; aged 74; died, August 27, of carcinoma of the pancreas and diabetes mellitus.

Henry S. Selman, Houston, Texas; Medical Department of Arkansas Industrial University, Little Rock, 1896; aged 72; died, September 9, of aortic stenosis and chronic myocarditis.

Lintsford B. Coates, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; aged 55; died, October 15, of chronic nephritis.

Esmond Ensley Council, Angier, N. C.; George Washington University Medical School, Washington, D. C., 1926; aged 30; died, September 12, of a self-inflicted bullet wound.

William Edwin Murphy ✠ Gulfport, Miss.; University of Pennsylvania School of Medicine, Philadelphia, 1918; aged 40; died, August 6, of tuberculosis and pulmonary hemorrhage.

Ernest E. C. Pollock, New Orleans; Medical Department of the Tulane University of Louisiana, New Orleans, 1893; aged 59; died, September 25, in Atlanta, of arteriosclerosis.

Gottfried Badertscher, Louisville, Ky.; Southwestern Homeopathic Medical College and Hospital, Louisville, 1901; aged 72; died, October 4, of carcinoma of the bladder.

Benjamin Johnson Bond, Tallahassee, Fla.; University of Maryland School of Medicine, Baltimore, 1904; aged 58; died, September 7, in Johnston's Hospital, of uremia.

Joshua C. Jarrett ✠ Valley Mills, Texas; Medical Department of the Tulane University of Louisiana, New Orleans, 1884; aged 73; died, September 27, of heart disease.

William Erastus Upjohn ✠ Kalamazoo, Mich.; University of Michigan Medical School, Ann Arbor, 1875; aged 79; died, October 18, of arteriosclerosis and diabetes mellitus.

Jean Russell La Vanchy, Carthage, Ind:; Indiana University School of Medicine, 1931; aged 25; was found dead, October 9, of poison, presumably self-administered.

Wilfred Alonzo McIntosh, Simcoe, Ont., Canada; Trinity Medical College, Toronto, 1896; formerly mayor; aged 62; died, August 29, in the Toronto General Hospital.

Henry George, Victoria, B. C., Canada; M.R.C.S., England, and L.R.C.P., London, 1887; formerly medical health officer of Red Deer; aged 68; died, August 13.

Richard A. Marshall, Wichita, Kan.; Medical Department, University of Tennessee, Nashville, 1884; aged 74; died, October 11, in the Wesley Hospital, of uremia.

Arthur J. Larson ✠ Mobridge, S. D.; Northwestern University Medical School, Chicago, 1927; aged 37; died, September 2, in Madison, Minn., of carcinoma.

William Archibald McDowell, Scranton, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1896; aged 59; died in October, of heart disease.

Charles P. Chapin, Buffalo; University of Buffalo School of Medicine, 1891; aged 71; was killed, September 29, near Scranton, Pa., in an automobile accident.

Otto Edwin Alving, Virginia, Minn.; Royal Karolinska Institute of Medicine and Surgery, Stockholm, Sweden, 1898; aged 62; died, October 10, of carcinoma.

Joseph Summers Turner, Los Angeles; College of Physicians and Surgeons, Keokuk, Iowa, 1875; aged 78; died, September 27, of carcinoma of the prostate.

Henry J. Casedy, Chicago; Hahnemann Medical College and Hospital, Chicago, 1903; aged 69; died, September 20, of mitral stenosis and coronary sclerosis.

John W. Thompson, Centerville, Tenn.; University of Nashville Medical Department, 1869; formerly county health officer; aged 62; died, August 31.

James K. P. Caldwell, Jackson, Tenn.; University of Louisville (Ky.) School of Medicine, 1881; aged 75; died, October 10, of acute pancreatitis.

Daken Whittaker Cunningham, Pittsburgh; Jefferson Medical College of Philadelphia, 1890; aged 68; died, September 29, of angina pectoris.

Alfred D. Bedford, Colton, Calif.; Jefferson Medical College of Philadelphia, 1877; aged 83; died, August 7, of chronic prostatitis and arteriosclerosis.

Edgar C. Neely, Harrisburg, Pa.; Medico-Chirurgical College of Philadelphia, 1898; aged 58; died, October 3, of septicemia and diabetes mellitus.

Lewis Thomas Francis, Renville, Minn.; Chicago Homeopathic Medical College, 1884; aged 77; died, September 26, of carcinoma of the rectum.

Peter Langland, Milwaukee; Chicago Medical College, 1875; aged 79; died, October 11, in the Evangelical Deaconess Hospital, of myocarditis.

Sylvester Louis Clabaugh, Essex, Iowa; Kentucky School of Medicine, Louisville, 1887; aged 75; died, September 30, of cerebral hemorrhage.

Matthew Cannon Armstrong, Jayess, Miss.; Louisville (Ky.) Medical College, 1904; aged 50; died, June 25, of organic heart disease.

Wales Scotland Brown, Ordinary, Ky.; Kentucky School of Medicine, Louisville, 1900; aged 63; died, October 9, of cerebral hemorrhage.

Charles Isaac Whiteway, Musgrave Harbor, Newfoundland; University of Toronto Faculty of Medicine, 1909; aged 54; died, July 29.

Joseph E. Bland, Louisville, Ky.; University of Louisville School of Medicine, 1879; aged 74; died, October 9, of heart disease.

Adolphus M. Doyle, Leoti, Kan.; American Medical College, St. Louis, 1882; aged 90; died, July 7, of cardiovascular renal disease.

Alem Price Hull ✠ Montgomery, Pa.; Jefferson Medical College of Philadelphia, 1873; aged 83; died, October 14, of pneumonia.

Benjamin E. Daniel, Claxton, Ga.; Atlanta School of Medicine, 1909; formerly mayor of Claxton; aged 46; died, August 23.

Julius Henry Lee, Chicago; College of Physicians and Surgeons of Chicago, 1886; aged 76; died, October 15, of carcinoma.

Cornelius C. Howard, Memphis, Tenn.; Memphis Hospital Medical College, 1906; aged 62; died, October 7, of angina pectoris.

Arden M. Barnett, Carthage, Miss. (licensed, Mississippi, 1890); also a minister; aged 67; died, October 9, of typhoid fever.

Benjamin F. Hoy, Syracuse, Ind.; Toledo Medical College, 1883; aged 71; died, October 9, of cerebral hemorrhage.

William Kendall Hall, Vancouver, B. C., Canada; Manitoba Medical College, Winnipeg, 1900; aged 56; died, July 28.

Bureau of Investigation

ALKA-SELTZER

Aspirin Sold under Misleading Claims

The Miles Medical Company of Elkhart, Ind., have been known for years as the exploiters of the "Miles Nervine," a bromide mixture. Within the last year the same concern has been exploiting and advertising heavily "Alka-Seltzer Tablets," described as "effervescent alkaline tablets."

The entire trend of the advertising is to give the impression that Alka-Seltzer Tablets are simply a mild effervescent alkaline preparation. In fact, one of the largest newspapers in the middle west, which had doubtless been offered the Alka-Seltzer

Say "GOOD BYE" to
Colds, Headaches, Sour Stomach, Acid Indigestion and Other Common Ailments
Try— ALKA-SELTZER
These remarkable Effervescent Tablets make a sparkling alkaline drink that gives you two-fold relief. First—it relieves the pain and discomfort and—Second, it corrects excess acidity, the common cause of most of your everyday ills. Find out about this new and better way—this safe, harmless way to say "Good-Bye" to most of your everyday aches and pains.
ALKA-SELTZER Tablets Make a Pleasant, Sparkling Anti-Acid Drink
Gives Amazing Relief
When you suffer with Headaches and Colds—Sour Stomach and Indigestion—Rheumatism and Neuralgia—when you feel tired-out, run-down, dull and depressed—the chances are that too much acid in your system is the real cause of the trouble. Scientists tell us that to keep healthy and vigorous our bodies must be slightly more alkaline than acid. Too much rich food, over-eating, over-work or over-indulgence usually produces an excess acid condition in your body. Then your resistance goes down—vitality is lowered and you become a victim of stomach disorders, headaches, colds and the many other everyday ills so common to us all.
Now science has developed a remarkable Effervescent Alkaline Tablet that quickly corrects this excess acid condition. It's called ALKA-SELTZER, because it makes a sparkling alkaline drink that first relieves the pain of everyday ailments and then corrects the cause (excess acid). There is nothing on the market like ALKA-SELTZER. It is a scientific product—harmless to take. There is nothing equal to it for giving prompt and effective relief for most of your common ailments.
An ALKA-SELTZER Tablet in a glass of water makes a sparkling, effervescent drink. It relieves pain—it corrects excess acid—it sweetens the stomach and it soon makes you feel your normal healthy self again.
Don't fail to try ALKA-SELTZER if you want to experience the most welcome relief you have ever had for most of your everyday aches and pains.
Use the Coupon Below.
Alka-Seltzer
Try It— on this Special Offer
We make it easy for you to try ALKA-SELTZER and find out what remarkable relief it gives. Here's our Special Introductory Offer. Take the coupon to any drug store and the druggist will give you a regular 25c package for ONLY 10 cents.
You'll find it the best 10 cents you ever spent. Don't wait. Clip that coupon at once and get yourself a package of ALKA-SELTZER the next time you pass a drug store at this special low price.
At All Drug Stores
Large Size 81.00 Small Size 25c
Try a glass of ALKA-SELTZER at any Drug Store Soda Fountain
This Coupon Worth 15c
Take this coupon to any Drug Store and as a Special Introductory Offer, the druggist will give you a regular 25c package of ALKA SELTZER tablets for only 10 cents.
NAME
ADDRESS
DRUGGIST: Mail this coupon to us signed by the customer and we will replace each package you give out on this Special Offer.
DR. MILES LABORATORIES Dept. SD 2, Elkhart, Ind.

Facsimile (greatly reduced) of a newspaper advertisement of Alka-Seltzer.

advertising, wrote to the Bureau of Investigation asking for an opinion on the merits of the preparation. The advertising manager who made the inquiry stated: "It is my understanding Alka-Seltzer is composed chiefly of sodium bicarbonate in an effervescent tablet."

Some of the claims in the expensive advertisements that have appeared in magazines during the present year make clear the attempt to mislead the public with regard to the composition of this preparation. The following claims appear in an advertisement occupying two-thirds of a page of the *Country Home:*

"Alka-Seltzer Tablets are the most effective way to alkalize your system.

"A tablet of Alka-Seltzer in a glass of water makes a bubbling glassful of the vital alkaline minerals which you need to alkalize your system and relieve your cold."

In an advertisement that occupied two-thirds of a page of Hearst's *Cosmopolitan* for April, 1932, and a half page of *Collier's* for March 5, 1932, there appeared these claims:

"We are all fond of rich foods, good times, late hours—but it is these indulgences which cause EXCESS ACIDITY. Then the 'Alkaline Reserve' is lowered, we become an easy victim of Colds, Headaches, Stomach disorders and other common ills. That's the time to use Alka-Seltzer Tablets to alkalize your system."

In a large display newspaper advertisement we read:

"Don't confuse this new Effervescent, Alkaline tablet with the ordinary type of remedies. Alka-Seltzer is a scientific product—a corrective alkaline drink that first relieves the pain and discomfort of every-day ailments and then removes the cause. There is nothing on the market like it—there is no equal to it."

Because of the large number of inquiries received regarding this product, the American Medical Association Chemical Laboratory was asked to analyze it. The chemists' report follows:

LABORATORY REPORT

"One original package of Alka-Seltzer (the Dr. Miles Medical Company, Elkhart, Ind.) was submitted to the A. M. A. Chemical Laboratory for examination at the request of the Bureau of Investigation. The package consisted of a carton containing advertising and a long, narrow, wide-mouthed bottle fitted with a tight-fitting paraffined cork stopper. The label on the bottle stated, 'Keep Bottle (Tightly Corked) in Cool Dry Place.'

"The printed material on the carton, the label on the bottle and the accompanying advertising listed conditions for which this remedy might be used, and recommended doses of one or two tablets which, with the repetitions suggested, might run as high, in some cases, as 16 tablets in 24 hours. In most cases the tablets were to be taken in water, but for certain conditions the directions merely stated, 'one tablet after meals as necessary.'

"The bottle contained 25 large wafer-like tablets, the average weight of which was 3.51 Gm. (54 gr.). The tablets were effervescent in water and effloresced in air with some further decomposition. Qualitative tests indicated the presence of relatively large quantities of acetylsalicylic acid and salicylate, citric acid, sodium and bicarbonate. Qualitative tests made under controlled conditions indicated only very slight traces of calcium, magnesium, potassium and phosphate. There was a slight odor of acetic acid when the bottle was first opened. Sulphates, halides, heavy metals, arsenic compounds, emodin-bearing drugs and alkaloids were not found.[1]

"The analytic procedures accounted for approximately 94 per cent of the original. Other determinations gave corroborative

1. Quantitative determinations on a product that is essentially an intimate mixture of acids and a bicarbonate are difficult because moisture causes interaction and changes in composition. This particular mixture of acids increases the difficulties for two reasons: (1) methods specific for the direct determination of citrates are not sufficiently exact in addition to being difficult and tedious; (2) acetylsalicylic acid in contact with moisture and especially alkaline solution gives rise to two acids (salycylic acid and acetic acid), both difficult of determination in such a mixture. It is obvious that quantitative determinations on this type of a preparation do not reach the degree of exactness that may be attained with simpler analytic procedures. The question also arises as to how much the mixture had reacted before the examination was started. The determinations show as far as possible what the mixture was *at the time* the analysis was started and not what the manufacturer put into the tablet, and not what would be ingested if dropped into water and taken. Furthermore, the analyses of other specimens might not give similar results because the amount of interaction cannot be controlled.

To avoid further interaction during the period of examination of this product, exposure of the specimen to the air was avoided as much as possible. These precautions included the keeping of the specimen in a tightly stoppered bottle which was in turn kept in a desiccator at all times except when material was being taken for analytical purposes.

The general scheme of the examination was as follows: The material, accurately weighed, was percolated with a solution of equal portions of petroleum ether and absolute ether. The resulting extract was titrated with standard alkali. Then the acetylsalicylic acid was hydrolyzed by addition of standard alkali and the excess alkali titrated with standard acid. The degree of hydrolysis was used as a basis for calculating acetylsalicylic acid. Total salicylic acid was then determined in the mixture by forming an iodine compound. When the result was calculated to acetylsalicylic acid, it checked quite closely with the value obtained in the hydrolysis experiment. This was the basis for the conclusion that all of the salicylic acid in this fraction was present as acetylsalicylic acid. The original titration value minus the equivalent of the acetylsalicylic acid gave a value to which was assigned the citric acid in this fraction.

The original was then extracted with absolute alcohol and the extract treated as was the ether, petroleum ether extract. In this case the total salicylate determination furnished more than enough salicylic acid for the acetylsalicylic acid found by titration. The excess was accordingly reported as salicylic acid. The sum of the equivalents of the salicylic and acetylsalicylic acids were subtracted from the original titration and the remainder calculated to citric acid.

The original was then extracted with water. In the resulting solution sodium bicarbonate was determined by titration. Total salicylates were again determined, and the results reported as salicylic acid.

evidence that the values were in the order of the reported values. The values found according to the outlined procedures are:

Acetylsalicylic acid per cent.....	8.30	7.94	8.50
Salicylate as salicylic acid per cent....	.75	.65	.68
Citric acid per cent.....	32.95	34.07	32.94
Sodium bicarbonate per cent.....	51.92	51.67	52.08
Difference (including moisture)[2].....	6.08	5.67	5.80

"From the foregoing, it is concluded that the Alka-Seltzer Tablet material examined contained essentially acetylsalicylic acid, 8.2 per cent; salicylic acid, .7 per cent; citric acid, 33.3 per cent; and sodium bicarbonate, 52.0 per cent. Each tablet would be equivalent to .28 Gm. (4.4 gr.) acetylsalicylic acid; .025 Gm. (.4 gr.) salicylic acid; 1.17 Gm. (17.8 gr.) citric acid; and 1.82 Gm. (28 gr.) sodium bicarbonate. The maximum daily dose (16 tablets) would be .4613 Gm. (70.84 gr.) acetylsalicylic acid; .4 Gm. (6 gr.) salicylic acid; 18.73 Gm. (287 gr.) citric acid, and 29 Gm. (449 gr.) sodium bicarbonate."

It appears, then, that this "sparkling alkaline drink" produced by dissolving two tablets of Alka-Seltzer in a glass of water, as is suggested on the trade package, contains nearly nine grains of aspirin (acetylsalicylic acid) and nearly one grain of salicylic acid in an effervescent mixture of citric acid and baking soda. A person who might follow the directions and take sixteen tablets a day, would consume over seventy grains of aspirin and over six grains of salicylic acid in that period, together with the effervescent ingredients citric acid and baking soda.

While the public has a general impression that aspirin is quite harmless, the medical profession knows its potentialities for producing alarming symptoms in many instances. The promiscuous use of aspirin by the public has shown that there are cases of special susceptibility which reveal symptoms of poisoning, such as swelling of the lips, tongue, eyelids, nose, or of the entire face, also hives, dizziness, nausea, and sometimes cyanosis. Some people have learned by experience that they are susceptible to aspirin and carefully avoid it. There is nothing in the advertising of Alka-Seltzer to lead anyone to suppose that this product is anything but a simple alkaline effervescent tablet containing no drugs of importance.

2. In one determination over sulphuric acid the loss was 0.22 per cent.

Correspondence

"ELECTROCARDIOGRAPHIC INTERPRETATION"

To the Editor:—Approving quite thoroughly of the splendid series of articles on, "The Fundamentals of Electrocardiographic Interpretation," I cannot refrain from uttering a criticism of the article published October 22. The author presents a number of records showing bundle branch block, along with a short discussion of the mechanism of this disturbance. He states that more than 90 per cent of the cases show the right bundle to be involved, and he offers an explanation. In his records he labels the instances of block according to the old terminology and neither in the records nor in his text does he make any mention of the new terminology, which is quite the reverse of the old. It is my opinion that the evidence in favor of the new concept is sufficiently conclusive at least to justify its mention. I would go further and say that it is my impression that this new concept is rather generally accepted by the majority of cardiologists.

I would refer to the extensive and highly critical article by F. N. Wilson, A. G. Macleod and P. S. Barker on "The Interpretation of the Initial Deflections of the Ventricular Complex of the Electrocardiogram" (*Am. Heart J.* **6**:637 [June] 1931). This article also contains references to the literature of this phase of the subject.

I have taken the liberty of uttering this criticism primarily because I feel that such a good series of articles as these which you are now running should certainly be kept up to date and that even if the author does not feel able to accept the new concept he at least owes it to his readers to acquaint them with it that they may judge its merits for themselves.

I should also like to direct attention to the statement concerning the frequency or, rather, the infrequency of right bundle branch block to be found on page 261 (paragraph 3) of White's "Heart Disease."

CARY EGGLESTON, M.D., New York.

EFFECT OF IRRADIATED OILS ON HEALING OF WOUNDS

To the Editor:—In an editorial in THE JOURNAL (October 15, p. 1356) you discuss the papers by Eising and by Ross on the effect of irradiated oils on the healing of purulent wounds. In this editorial you repeat the conclusion of each of these workers that the effect was due to "secondary ultraviolet emanations."

We have accumulated evidence (*J. Bact.* **23**:429 [June] 1932; *J. Indust. & Engin. Chem.* **24**:1181 [Oct.] 1932) that this germicidal action is evidently due to certain organic peroxide compounds given off from the irradiated oils. We have proved conclusively that secondary emanations of light are not responsible for this phenomenon. Recently Dr. Eising agreed with us in this explanation.

The "radiation theory" has been used before to explain phenomena. Certain chemical substances will fog photographic plates in the same manner as light.

It is unfortunate that your editorial reiterated what we feel certain is a faulty conclusion, for those interested in this new and important principle will be misled in their reasoning and its application.

ROBERT S. HARRIS,
JOHN W. H. BUNKER,
NICHOLAS A. MILAS,
Massachusetts Institute of Technology,
Cambridge, Mass.

KOREMLU CREAM—A DISCLAIMER

To the Editor:—In the July 30 issue of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION mention is made in the article dealing with Koremlu Cream that I had concurred in the opinions of Drs. Pease and Wimmer regarding Koremlu Cream.

The truth of the matter is this: I was employed by the Koremlu Company as a consultant in an attempt to find a low-melting wax to act as a mechanical depilatory. My work was confined exclusively to this and to no other problem. Dr. S. Bradford Stone, who worked with me, has already written to you to substantiate this statement.

I never experimented either with Koremlu Cream or with thallium compounds, and I never made any statement regarding the merits or demerits of any such products. When I was asked by the Koremlu Company to express an opinion regarding the thallium controversy, I recommended that they underwrite research to be conducted by reputable scientists who would be acceptable to the American Medical Association. Mr. Karl M. Herstein of the American Institute of Chemists, Woolworth Building, New York City, had advised me not to have anything to do with the thallium problem, and it was he who recommended the names of the research organizations which I gave to the Koremlu Company. His excellent advice was adhered to scrupulously. Mr. Herstein will corroborate this statement if called on.

LOUIS SATTLER, New York.

[EDITORIAL NOTE.—Readers of THE JOURNAL will remember that Koremlu, a viciously dangerous depilatory containing thallium acetate, has been the subject of more than one article in the Bureau of Investigation Department of THE JOURNAL. In the article referred to by Dr. Sattler it was brought out

that over thirty cases of serious poisoning had been reported as the result of using Koremlu Cream. It was also brought out that Dr. Herbert D. Pease of the Pease Laboratories and Dr. Curt P. Wimmer of the College of Pharmacy of Columbia University were alleged by the Koremlu concern to have given Koremlu Cream a clean bill of health. In addition, the article quoted from a letter written by the Koremlu concern in which the alleged harmlessness of Koremlu Cream, as ascribed to Drs. Pease and Wimmer, was mentioned, and the further claim made: "This information is concurred in by our consulting chemist, Dr. Sattler, professor of chemistry at Brooklyn College." The Koremlu concern, in addition to selling the thallium acetate cream called Koremlu Cream, also sold Koremlu Wax, a mechanical depilatory that was undoubtedly sold for the purpose of satisfying those who found that Koremlu Cream was not a depilatory, in spite of the claims made for it.]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

STUTTERING

To the Editor:—Will you please advise me as to the treatment and prognosis of stuttering, in a girl aged 2½ years. Articulation is distinct, and the separate sounds are properly produced, but there is difficulty in the starting of sentences and in connecting the consonants with the succeeding vowel. The child is well developed and nourished for her age but seems to have a tendency toward constipation. The father of the child is 33 years of age, both physically and mentally fit, with no tendency toward a nervous disposition, who gives a history of acquired stuttering since he was 7 years old, and attributes it to a fright. Has inheritance anything to do with the etiology? What steps should be taken to correct this condition? Please omit name.

M.D., Massachusetts.

ANSWER.—With respect to the onset of stammering in this child, two suppositions are conceivable. The first is that she reacted to her father's stammering by confusedly attempting to produce her own talking in the hesitating manner of the father's speech. If this is true and she persists in the mistaken effort, the eventual engrafting of a fixed state of stammering speech would be inevitable. The second supposition would be that the child, essentially uninfluenced by her father's stammering, has reacted to certain social situations, which to her were difficult, by nervously repeating the first sound or syllable or word, accompanied probably by some muscular strain, before being able to enter on a smooth, continuous, normal effort at talking. If such a nervous reaction continues, she will likewise inevitably become a confirmed stammerer. In either case, the essential fact is the continuity of a wrong mental attitude toward her social environment and toward the production of speech. Since the onset and development of her stammering are dependent on the creation and maintenance of this wrong mental attitude until fixed psychomuscular habits have been definitely created, the idea of stammering being due to heredity, excepting in the sense that heredity might create psychologic tendencies that render such a mental attitude more easy of creation, is hardly to be considered. Probably the most important factor in this situation is the child's reaction to the father's stammering. The immediate problem is to attempt to alter the child's mental attitude toward her social environment and the production of speech. The first thought would be to separate the child entirely from the father for a long period of time. If the habit of stammering is not already too firmly fixed, mere separation might be successful; but more probably, besides separation, other means also, of a psychologic nature to help the child to readjust herself to the social environment, and of a physiologic nature to help the child to conceive of the naturally smooth nature of speech, would be necessary. These are technical matters too detailed to be discussed here and susceptible of effective execution only by those especially educated for such work. Whether or not the child can be separated from her father, an effort to reclaim her speech should be made, on the lines suggested. In most cases the attitude of members of the family and friends toward the child tends to create self consciousness with reference to her speech disturbance and thus to increase the mistaken mental reaction that superinduces it. It is best to ignore the stammering and to be careful not even to talk about it in the child's presence. An effort should be made not to keep the stammerer in the limelight but to let her play much by herself or with other children. An attitude in the environment which encourages calmness on the part of the child is to be sought. Slow, calm, accurate speech in the child's presence is helpful.

Once established, stammering is one of the most tenacious of all functional psychomuscular disorders. Its tenacity suggests convulsive tic. In this case the time to act is now, under the guidance of a close student of the treatment of stammering. Another fundamental consideration has reference to the overcoming by the father of his own stammering, which is entirely possible even at his age, although difficult, if rightly attempted and if carried on with sufficient persistence. But the child's problem should not await the father's recovery. Now is the preferred time to attack her problem, rather than after the disorder has become firmly engrafted.

BLISTER BUG

To the Editor:—We have in our locality a species of bug which, when mashed on the skin, produces a painful blister. The insect is usually referred to as a "blister bug." Do you have any information regarding the process causing the blister, or any treatment to relieve the burning, stinging pain? Please omit name.

M.D., Texas.

ANSWER.—There are many species of the so-called blister beetles (of the Meloidae family). They are widely distributed in this country and, in fact, throughout the world. They are sometimes troublesome as a plant pest, feeding as they do on vegetable and field crops. If the insects are handled, as in picking them off the plants and especially if they are crushed on the skin, severe blisters may result.

The vesicating (blistering) effect is due to crystalline material called cantharidin (the inner anhydride, $C_{10}H_{12}O_4$, of cantharidic acid), which is contained in various parts of the bodies of these beetles and in certain other insects.

The dried bodies of blister beetles (mainly Cantharis vesicatoria L.), collected mainly in southern Europe, are a considerable item in the drug trade. This material, commonly known as Spanish flies or Russian flies, is used as a vesicant in the treatment of certain diseases and in certain hair tonics.

Avoidance of contact with the beetles is urged. If the beetles are abundant on crops, they may be killed with sodium fluosilicate applied as a dust. When one knows that he has had contact with a beetle, the area of contact should be promptly and thoroughly washed with soap and water to remove the oily liquid which contains the cantharidin. The use of ointments or greasy substances increases the deleterious effect. The vesicating action is rather slow. If blisters have formed they should be thoroughly washed and drained, preferably with a hypodermic needle, and the elevated skin clipped off. This is followed with compresses soaked in 2 per cent sodium bicarbonate solution and 1.5 per cent phenol, and later with some mild antiseptic ointment.

PERENNIAL HAY FEVER

To the Editor:—I would appreciate some information concerning a patient, a man, aged 24, in good physical condition and health, by occupation a baker. For the past year, every time he has worked with flour, an acute coryza, lacrimation, burning and tickling in his nose, and sneezing have occurred. If he wears a mask or as soon as he leaves the building, he is all right. Is there any way he could be desensitized? Do you have any suggestions aside from removal of the exciting cause?

H. V. Nuss, M.D., Sutton, Neb.

ANSWER.—The symptoms given fit in with the diagnosis of allergic rhinitis, also known as hyperesthetic or hypersensitive or vasomotor rhinitis, or perennial hay fever. The fact that symptoms occur while the baker is at work and disappear when he leaves the bakery gives practical assurance that the etiologic or exciting factor is one or more of the flours that he handles. The first question is to find out which one, and this can be readily determined by skin tests with various cereals, such as wheat, rye, oat, corn, rice, buckwheat and barley. He may be sensitized to more than one. After it has been determined which one is the cause, desensitization can be carried out and is frequently quite successful. For example, in a case of bronchial asthma due to wheat, reported by Leon Unger (*Illinois M. J.* **44**:40 [July] 1923), desensitization was successfully carried out in 1922 and the patient is still all right and is able to handle flour and eat foods containing wheat. In order to obtain good results it is important to eliminate all wheat-containing foods from the diet; at the same time the baker should protect himself by wearing a wet mask while at work. In fact, it would be better if he could avoid the bakery for three months, if possible. Desensitization should begin with injections of small doses of extract, gradually increasing. The

directions for this may be obtained from the pharmaceutic houses that are able to supply desensitization sets. Oral desensitization is probably not as effective as hypodermic. However, after the maximum injection has been reached, feeding of wheat should begin by permitting a small piece of cracker and gradually increasing amounts of wheat. Similar methods obtain if it is found that some other cereal is the cause of the symptoms.

ADEX TABLETS SOLD WITH EXAGGERATED CLAIMS

To the Editor:—In looking over the *Parents' Magazine* for this month I was very much surprised to see a Squibb Adex Tablet advertisement which in its headline names several diseases—measles, whooping cough, scarlet fever and mumps—giving the definite impression that Adex Tablets are a preventive so far as these diseases are concerned, or that their serious after-effects may be prevented. Several other diseases are mentioned in the body of the copy, pneumonia and weak lungs, among them. As I understand it, vitamins A and D as present in cod liver oil, and I assume therefore as present in the tablet concentrate, have not been proved to be a specific preventive of even a common cold. Is this concern, then, correct in the implication that it definitely conveys in the use of all these names of fearsome diseases? G. S. S., New York.

ANSWER.—Squibb Adex Tablets were submitted to the Council on Pharmacy and Chemistry some time ago. The Council found the product not acceptable for New and Nonofficial Remedies and a report to this effect was published in THE JOURNAL (March 19, 1932, p. 983). The implications referred to in the advertisement by the correspondent are definitely misleading. Adex Tablets will do no more than will cod liver oil. The Council has declared there is no evidence to show that vitamin A will prevent any of the respiratory diseases mentioned in the advertisement. It would appear that E. R. Squibb & Sons is advertising the accepted product cod liver oil to the profession with conservative claims and that Adex Tablets are being advertised to the public with claims that are not countenanced by conservative medical opinion.

CHROMATE DERMATITIS FROM "PROTEX METALLUM"

To the Editor:—By mistake a creamery worker used the powder "Protex Metallum," manufactured by the Diversey Corporation, Chicago, in place of a milder one for hand-washing of utensils, with the result of a chemical burn or poisoning of the arms, hands and front part of the legs and feet, wherever the solution came in contact with the skin. After the peeling of the hands, arms and feet, several necrotic areas started. I am anxious to learn whether there is anything about this other than alkali and if so what I should do. Kindly omit name. M.D., Iowa.

ANSWER.—An inquiry was sent to the Diversey Corporation concerning the composition of "Protex Metallum." In reply the firm said:

> Protex Metallum is the only cleaning compound that can be used for cleaning tinned metal surfaces without causing corrosion. It is largely used for machine washing. When it is used for hand-washing, precautions must be taken in order to prevent dermatitis on the portions of the skin exposed to the Protex Metallum solution, because of the fact that one of the necessary ingredients in Protex Metallum is sodium chromate. It has long been known that sodium chromate frequently causes dermatitis.

The firm also states that it recommends the use of 5 per cent ammoniated mercury ointment for the treatment of chromium sores. Dermatitis from chromium compounds and its treatment have been discussed in the pages of THE JOURNAL as follows:

Industrial Hazard of Chromic Acid, Queries and Minor Notes, Feb. 21, 1931, p. 633.
Chromium Poisoning and Ludwig's Angina, Queries and Minor Notes, April 9, 1932, p. 1921.
Smith, Adelaide R.: Chrome Poisoning with Manifestations of Sensitization, July 11, 1931, p. 95.

DEATH BY DROWNING

To the Editor:—In asphyxiation from submersion beneath water, does any water get into the alveoli of the lungs? Or is there only a small amount of water in the trachea and bronchi? It is my opinion that, during attempted inhalation under the water, the glottis closes after a small amount of water has entered the trachea. The glottis remains closed until just before death, when all reflexes are lost, thus permitting the lungs to fill with water. Are these opinions correct? The rescue squad of the Interstate Power Company says that it has found practically no water in the lungs of men resuscitated after being submerged in water. When death occurs following prolonged submersion under water, are the lungs filled with water?

CHARLES WAGGONER, M.D., Clinton, Iowa.

ANSWER.—In at least more than 90 per cent of the cases of drowning, death results from asphyxiation, which may be brought about in two ways: (1) from spasmodic closure of the glottis, in which case the victim usually sinks at once and remains submerged, only comparatively minute amounts of water entering the respiratory tract, and (2) from the entrance of water into the respiratory tract clear down into the alveoli of the lungs. It is believed that in by far the larger number of cases of drowning there is no occluding spasm of the glottis. In the struggle, water is drawn down into the lungs, from which it may pass rapidly by osmotic action into the blood, which consequently becomes thinner in the left than in the right cavities of the heart. Sand, grit, mud and other materials also may be drawn into the lungs with the water. At the same time more or less water is swallowed, and regurgitation of the stomach contents may occur, some of which may pass into the lungs as well. In experimental drowning of dogs in colored fluid, the fluid is found in the pulmonary alveoli.

BRONCHOSCOPY

To the Editor:—I have a patient who requires frequent bronchoscopic drainage. He finds that treatment with a Brunier bronchoscope is more comfortable than with any other model. Will you kindly give me the names of several bronchoscopists in Pittsburgh, Baltimore, Philadelphia or New York who use the Brunier?

GEORGE S. ENFIELD, M.D., Bedford, Pa.

ANSWER.—As with other operators, bronchoscopists probably choose the instruments they deem best for the work to be done. We are unable to classify them by instruments used and would suggest inquiry of the members of the American Bronchoscopic Society in the respective cities. Their names and addresses may be obtained from the Secretary, Dr. Edwin McGinnis, 104 South Michigan Avenue, Chicago.

TRAUMATIC PERITONITIS

To the Editor:—I recently attended an autopsy of a man who died one week after a drunken brawl. The only external sign of injury was a bruised and swollen right testicle. Autopsy showed a peritonitis and enlarged and soft kidney and heart. Could this have been a traumatic peritonitis as the cause of death, due to absence of organic lesions or perforation in the abdomen and in view of the history of trauma? A diagnosis of peritonitis was made before death. I should appreciate your opinion as to the cause of death and any references on traumatic peritonitis especially from injuries to testicles. Please omit name.

M.D., New Jersey.

ANSWER.—General peritonitis, secondary to external injury to the abdomen but without gross lesions of the abdominal wall or of the abdominal organs, may occur according to reports in medical literature. In cases apparently of this nature there may be minute hemorrhagic extravasations and tears that escape observation. The examination must be made with extraordinary care and thoroughness. Pathogenic bacteria may invade the peritoneum directly from the abdominal tissues or organs, particularly the gastro-intestinal and genito-urinary tracts, and also from distant sources by way of the blood or lymph. Acute peritonitis may arise from direct extension or indirect transfer from infectious orchitis following trauma to the testicle. As nothing is said in the question about the age and the general condition of the patient, it may be in order to recall that in chronic diseases of various sorts the resistance of the peritoneum to infection often appears to be lowered.

ANAPHYLAXIS

To the Editor:—1. I have a patient to whom I have been giving theelin (P. D. & Co.), 1 cc. a day, for disturbances due to the menopause. This is now well under control and I wish to give but 1 cc. every fourth day and later once a week. I also have a patient with ulcerative colitis to whom I have been giving antistreptococcic serum as described by Dr. J. A. Bargen, using Parke Davis preparation Bio 2035. I have been giving 2 cc. a day with excellent results and am now ready to reduce the dose to once or twice a week. 2. A short time ago I saw a case that resulted fatally of anaphylaxis. What are the possibilities of this result with these cases? It is my understanding that, if daily doses are given, an anaphylactic phenomenon cannot occur but that if there is an interval of two weeks or more there is danger of such a result. Is this true? 3. If a patient is sensitive to horse serum and antitoxin is given one day, is it necessary to desensitize before giving a dose the next day? 4. A patient who had typhoid when 8 (she is now 17) wishes typhoid vaccination. Will she have more or less reaction than the normal patient? Please omit name.

M.D., Indiana.

ANSWER.—1. The possibility of fatal anaphylaxis from injections as described of theelin and antistreptococcic serum may be said to be very remote.

2. Anaphylactic reactions are more likely to occur after injection with longer intervals, say, of two weeks.

3. It would be safer to desensitize again on giving antitoxic serum to a sensitive person desensitized the day before.

4. The patient is more likely to have a somewhat more severe reaction than a person who has not had typhoid or typhoid vaccination previously.

HEADACHE IN LINOTYPE OPERATOR

To the Editor:—Please let me know whether there is anything in the operation of a linotype machine that could cause severe headaches. I have a patient, aged 21, who has headaches only when he is operating the machine. The patient is in good health; a thorough physical and laboratory examination has found nothing abnormal. He has also been examined by a competent otolaryngologist, with a normal report. Please omit name.

M.D., Georgia.

ANSWER.—In the old models of linotype machines the molten lead pots were open and were heated by gas. Under such conditions both lead and carbon monoxide poisonings might—and did—arise. In modern machines the lead chambers are completely enclosed and are heated by electricity.

Extensive examinations have failed to disclose lead poisoning, except as linotypers were working near to other lead hazards. Lead poisoning is, however, a possibility. Both lead and carbon monoxide are well known causes of headache. A headache limited to the actual period of work on a modern machine is more likely to result from defective vision, poor illumination, glare or fatigue, or possibly from high temperatures. In some printing plants, vibration and noise are factors in fatigue production, and ultimately in headache.

DEANE'S DYSPEPSIA PILLS AND ARGYRIA

To the Editor:—I am anxious to obtain a diagnosis on a patient who came into my office this morning. It appears to be a case of argyria. His entire body, but especially his face and fingers, presents a homogeneous dark bluish slate color—similar to the appearance of one under an alpine sun lamp but darker. Even his lips and sclerae are discolored. He is around 60; the blood count and all other observations are negative. He feels all right. The condition has been slowly developing for eight or nine years and within the past four years the same discoloration started on his wife within the region of the nose and mouth. The only drug taken for the past fifteen years has been Dr. Deane's Dyspepsia Pills. His wife started on them a few years ago also. Any information about these dyspepsia pills will be appreciated.

W. M. BOWMAN, M.D., Petersburg, Va.

ANSWER.—We have made no complete analysis of Deane's Dyspepsia Pills. In 1920 a Philadelphia physician wrote, stating that he had a patient who had been taking the Deane nostrum for about ten years and whose face, scalp, neck and upper part of the torso were an ashy gray. Tests made at that time by the A. M. A. Chemical Laboratory disclosed the presence of silver. Recent tests (September, 1932) also show silver to be present in Deane's Dyspepsia Pills.

TIME FOR EFFECT OF LOCAL ANESTHETIC IN TONSILLECTOMY

To the Editor:—In the performance of a local tonsillectomy I have been somewhat puzzled as to the time interval which one should allow to elapse before operative procedure is started. In perusal of the literature on the subject one finds some authors stating that one should wait for a period of five minutes before beginning the dissection, while others advocate waiting fifteen and twenty-five minutes. I would suppose that studies have been made by pharmacologists as to the optimum time that procaine-epinephrine solution should remain in contact with sensory nerves to produce the most profound effect. I have not been successful in finding literature on this point and should be pleased to receive an opinion with regard to it.

T. W. BUCKINGHAM, M.D., Bismarck, N. D.

ANSWER.—It has been the experience of many operators who employ procaine-epinephrine solution to wait about five minutes before beginning the operation, as this gives a most satisfactory anesthesia. This is especially true when the nerve blocking injections have been used. There would be no harm in waiting ten minutes, but it is doubtful whether any advantage is obtained by waiting any longer than this before proceeding with the operation.

IRRIGATIONS IN GONORRHEA

To the Editor:—What is the consensus regarding the use of urethral irrigations under hydrostatic pressure (as in the Genet method) in acute and chronic gonorrheal urethritis in the male? Please omit name.

M.D., Nebraska.

ANSWER.—There is no consensus regarding the use of hydrostatic pressure irrigations for acute and chronic gonorrheal urethritis. Those who use high pressure condemn the method as a great factor in the production of complications. Those who court gentleness by using low pressures and mild solutions, used not too often, extol the method.

The real truth is that low pressure (from 2 to 3 feet) irrigations offer a most valuable means for cleansing and medicating the urethra and the bladder, and those who use them carefully and intelligently do not produce complications. They would be loath to be deprived of so valuable a procedure in the treatment of gonorrhea.

MOLASSES

To the Editor:—Molasses has far greater laxative action than can be accounted for by the carbohydrates which it contains. It is also used by horsemen as a tonic for their ailing horses. Can you give me any information as to whether it has any specific laxative principle? Also as to what its vitamin properties are? Please omit name.

M.D., Connecticut.

ANSWER.—The colloidal materials present in molasses probably improve absorption of the sugars to a sufficient extent to have them enter the bowel in larger quantity than if they are ingested in a pure state. Vitamins B and E are alleged to be present in molasses.

JELLYFISH, OR "PORTUGUESE MAN-O'-WAR"

To the Editor:—In THE JOURNAL, September 17, a reply to the question regarding the treatment of the bite of the jellyfish, or so-called Portuguese man-o'-war, was given considerable space. The reply is somewhat superficial.

Students of biology have long understood the real nature of the sting of the "Portuguese man-o'-war." This beautiful colonial jellyfish is a balloon-shaped hemisphere with long central tentacles, varying in length from six inches to several feet. The structure of these tentacles is jellylike in nature, with an occasional stinging cell, or nematocyst, as it is called, rising from the interstitial cells and lying on an epitheliomuscular base. The interstitial cells are the parent bodies for the nematocyst and are called cnidoblasts. The latter structure, a pear-shaped cell containing a peripheral nucleus, is apparently hollow but in reality is filled with a clear fluid. Inverted and suspended in this fluid, with attachments to the upper pole of the cell, is a coiled, threadlike tube with barbs at its base. Protruding above the surface of the cellular epithelium is a small trigger-like process directly associated with the inverted barb. The latter structure functions as a trigger, which, when struck, varies the internal pressure of the cell, producing an explosion and eversion of the coiled threadlike tube and barb.

The latter penetrate or coil about the offending object, penetrating surprisingly deep into the tissue of small prey and animals. Thus is released a chemical substance known as hypnotoxin, an organic substance whose chemical formula is not known but which functions as a poison, paralyzing immediately the small animals "shot" by the barbs and causing a local irritation wherever injected. The mechanism is entirely a defense one, as well as being calculated to assist in capturing small prey as food for the jellyfish.

Large doses of hypnotoxin, accompanied by the pain of these penetrating barbs when they are sufficiently numerous, produce a severe and prolonged effect in higher animals, including man. I have many times experienced the feeling of nausea from the pain inflicted when diving into the tentacles of the sea nettle. Apparently the cell may be protruded with such tremendous force that the entire nematocyst will be extruded and may be seen under the microscope hanging as a gourdlike structure about the legs or other appendages of small sea animals. These explosions may be artificially stimulated in the laboratory by the application of methyl green or acetic acid. However, for the hypnotoxin to function, a moist medium appears to be necessary. While assorting large quantities of shrimp from sea nettles, I have evidently been stung in the face and eyes by these microscopic nematocysts but was unaware of their presence until afterward, while washing my face. Then I became well aware of their presence by a severe and prolonged stinging effect, in several instances a temporary conjunctivitis developing which resulted in difficulty in seeing, lasting several hours.

Hypnotoxin is believed to exist in other animals, even in man. Whether it is the same or is of a similar chemical structure has not been determined. Some writers assume that this special toxin is formed during the waking hours, finally accumulating in sufficient quantity to inhibit the activity of the cortical cells of the brain. Pieron supports this view by experiment. Very young dogs, when completely deprived of sleep, will die within four to six days. Pieron, using this method of experimental insomnia, discovered that the intoxication was manifested not only subjectively but microscopically, in that the cortical cells in the frontal region were definitely altered. Blood or cerebrospinal fluid from these animals, when injected into other animals, produces similar changes. Hypnotoxin is precipitated by alcohol and is destroyed by a temperature of 65 C.

It is evident from these facts that the treatment of jellyfish stings must take into consideration two things: the presence of the nematocyst as well as the injected hypnotoxin. I have found that, when one has unfortunately run into the tentacles of the jellyfish, immediate drying of the part affected, and the exertion of a dry pressure on the area, result in immediate relief. Rubbing the part with water or the wet hand seems only to irritate all the more, as likewise the application of sand from the sea bottom—a remedy common among bathers in the Southern waters.

The use of such soothing lotions, scrubbing with harsh soap, application of gasoline and the like, as suggested in the communication, may readily be considered good treatment in the light of the foregoing discussion. When severe local irritation persists for days, apparently the individual is hypersusceptible, and some form of an allergic reaction occurs, producing in some instances a true urticaria.

STEPHEN A. ZIEMAN, M.D., Chicago.
Head, Department of Chemistry and Physics,
De Paul University.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Milwaukee, June 12. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *General, oral and clinical.* Los Angeles, Dec. 7. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

CALIFORNIA: *Reciprocity.* Los Angeles and San Francisco, Dec. 14. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Endorsement.* Hartford, Nov. 22. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

DELAWARE: Wilmington, Dec. 13-15. Sec., Dr. Harold L. Springer, 1013 Washington St., Wilmington.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Dec. 30. Sec., Dr. W. C. Fowler, 203 District Bldg., Washington.

IOWA: Des Moines, Dec. 6-8. Dir., Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 13-14. Sec., Dr. C. H. Ewing, Larned.

KENTUCKY: Louisville, Dec. 6-8. Sec., Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND: *Regular.* Baltimore, Dec. 13-16. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 13-14. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MISSISSIPPI: *Reciprocity.* Jackson, Dec. 12. Sec., Dr. Felix J. Underwood, Jackson.

NEBRASKA: Lincoln, Nov. 29-30. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NORTH CAROLINA: Raleigh, Dec. 5. Sec., Dr. B. J. Lawrence, 503 Professional Bldg., Raleigh.

OHIO: Columbus, Dec. 6-8. Sec., Dr. H. M. Platter, 85 E. Gay St., Columbus.

VIRGINIA: Richmond, Dec. 7-9. Sec., Dr. J. W. Preston, 803 Medical Arts Bldg., Roanoke.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 17. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

ADDITIONAL HOSPITALS APPROVED

The Council on Medical Education and Hospitals of the American Medical Association has given its approval to the following hospitals since the publication of the last previous list in THE JOURNAL, June 11:

Hospitals Approved for Intern Training

St. Mary's Hospital, Quincy, Ill.
Rockford Hospital, Rockford, Ill.
Mercy Hospital, New Orleans.
Worcester Hahnemann Hospital, Worcester, Mass.
Murray Hospital, Butte, Mont.
Bronx Hospital, New York.
Jamaica Hospital, Richmond Hill, N. Y.
U. S. Marine Hospital, Galveston, Texas.
Medical and Surgical Hospital, San Antonio, Texas.
Bishop DeGoesbriand Hospital, Burlington, Vt.

Hospitals Approved for Residencies in Specialties

Neuro-Psychiatric Institute and Hospital of the Hartford Retreat, Hartford, Conn.
Delaware State Hospital, Farnhurst, Del.
Menninger Sanitarium, Topeka, Kan.
South Baltimore General Hospital, Baltimore.
Hastings Hillside Hospital, Hastings-upon-Hudson, N. Y.
Gowanda State Homeopathic Hospital, Helmuth, N. Y.
St. Lawrence State Hospital, Ogdensburg, N. Y.
New York State Hospital, Ray Brook, N. Y.
Rochester State Hospital, Rochester, N. Y.
Trudeau Sanatorium, Trudeau, N. Y.
Utica State Hospital, Utica, N. Y.
Butler Hospital, Providence, R. I.

Ohio Reciprocity Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports fifty physicians licensed by reciprocity with other states and 6 physicians licensed by endorsement, July 12, 1932. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1931)	Arkansas
Northwestern University Medical School		(1929, 2)	Illinois
Rush Medical College		(1926) New York, (1931)	W. Virginia
Indiana University School of Medicine		(1926) (1930), (1931, 2)	Michigan, Indiana
State University of Iowa College of Medicine		(1925)	Iowa
University of Louisville School of Medicine		(1931, 5)	Kentucky
Tulane University of Louisiana School of Medicine		(1930)	Louisiana
Johns Hopkins University School of Med.		(1928), (1931)	Maryland
Maryland Medical College		(1907)	Virginia
University of Maryland School of Medicine and College of Physicians and Surgeons		(1931)	Maryland
Tufts College Medical School		(1929)	New York
Detroit College of Medicine and Surgery		(1930), (1932, 3)	Michigan
Univ. of Mich. Med. Sch.		(1926), (1927), (1930), (1931, 3)	Michigan
St. Louis University School of Medicine		(1931, 8)	Missouri
Washington University School of Medicine		(1931)	Missouri
Syracuse University College of Medicine		(1931)	New York
University and Bellevue Hospital Medical College		(1926)	W. Virginia
University of Buffalo School of Medicine		(1931)	New York
University of Oklahoma School of Medicine		(1930)	Oklahoma
Jefferson Medical College of Philadelphia		(1897)	Penna.
Temple University School of Medicine		(1922)	Penna.
University of Pennsylvania School of Medicine		(1930)	Penna.
Meharry Medical Department of Walden University		(1911)	Georgia
Vanderbilt University School of Medicine		(1916)	Tennessee
Queen's University Faculty of Medicine		(1929)	Michigan

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Harvard University Medical School		(1923), (1930)	N. B. M. Ex.
St. Louis University School of Medicine		(1931)	N. B. M. Ex.
Washington University School of Medicine		(1928)	N. B. M. Ex.
University of Rochester School of Medicine		(1929)	N. B. M. Ex.
Western Reserve University School of Medicine		(1930)	N. B. M. Ex.

Hawaii July Report

Dr. James A. Morgan, Territory of Hawaii Board of Medical Examiners, reports the written examination held in Honolulu, July 11-14, 1932. The examination covered 10 subjects and included 55 questions. An average of 75 per cent was required to pass. Five candidates were examined, 3 of whom passed and 2 failed. Three physicians were licensed by endorsement. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Pennsylvania School of Medicine		(1930)	83.9
University of Pittsburgh School of Medicine		(1910)	88.2
Dalhousie University Faculty of Medicine		(1927)	89.9

College	FAILED	Year Grad.	Per Cent
Vanderbilt University School of Medicine		(1911)	53.3
University of St. Thomas College of Med. and Surg.		(1920)	56.2

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Northwestern University Medical School		(1929)	N. B. M. Ex.
St. Louis University School of Medicine		(1931)	N. B. M. Ex.
University of Nebraska College of Medicine		(1930)	N. B. M. Ex.

Book Notices

Recent Advances in Anæsthesia and Analgesia. By C. Langton Hewer, M.B., B.S., Anæsthetist and Demonstrator of Anæsthetics, St. Bartholomew's Hospital. Cloth. Price, $3.50. Pp. 187, with 64 illustrations. Philadelphia: P. Blakiston's Son & Company, Inc. 1932.

The preface says: "It may be well at the outset to make it clear that this little volume does not aim at being a textbook in the art of anesthesia and most of the elementary teaching and descriptions of well known methods have purposely been omitted. Its more modest object is to provide a concise collection of some of the important advances made during the past few years." The author has accomplished his purpose well. Usually it is difficult to accept the majority of statements made in a book of this type, but in this volume there appears to be but one major and one minor discrepancy. The major one is the whole-hearted endorsement of percain (nupercaine) for local anesthesia. This is in direct contradiction of the fundamental principle which the author follows in all but this instance: "At the present time, when novel methods and new drugs are being introduced almost daily, it is essential for the anesthetist to keep a balanced mind and not to pander to the spectacular at the expense of added risk. It is the firm belief of the writer that no new method of anesthesia or analgesia should ever be tried on the human subject unless there is adequate reason to think that it is at least as safe as the method which it is proposed to displace." A minor error is on page 100, where it is stated that "the solution should be forced out of the syringe during the movements of withdrawal and not on those of entry." The book is obviously intended for use both in England and abroad, and from that point of view the display of apparatus is incomplete. On the other hand, it is probable that the author has included only such apparatus as he himself is familiar with and knows to be an improvement over older types. This is the only book of its type that has appeared on the subject in recent years. Besides a fairly general review of the entire field it, includes probably most of the author's individual hobbies. There are chapters on the theoretical considerations of anesthesia and their practical application, on resuscitation, on premedication, on various

anesthetic agents including diethyl ether and divinyl ether, on modern apparatus for administration of anesthetic agents by inhalation, endotracheal and intrabronchial anesthesia, on the risk of explosion in anesthesia, on local and spinal anesthesia, and on the use of anesthesia in nasal, oral, dental, thyroid, thoracic and abdominal surgery, and in obstetrics. The final chapter is on anesthetic sequelae.

Studien zur Pathologie und Epidemiologie Ost-Afrikas: Beobachtungen und Untersuchungen im Mandatsgebiet Tanganyika (Deutsch-Ost-Afrika). Von Priv.-Dozent Dr. Otto Fischer, Oberarzt am Tropen-Genesungsheim Tübingen. Band XXXVI, Beiheft 1, zum Archiv für Schiffs- und Tropenhygiene, Pathologie und Therapie exotischer Krankheiten. Herausgegeben von Prof. Dr. C. Mense und anderen. Schriftleitung: Prof. Dr. F. Fülleborn, Prof. Dr. M. Mayer, Prof. Dr. P. Mühlens. Paper. Price, 6 marks. Pp. 104, with 49 illustrations. Leipzig: Johann Ambrosius Barth, 1932.

This report consists of observations made in the years 1928-1930 in the former colony of German East Africa, now the mandated territory of Tanganyika. There are (1) an introductory section on the geography and climatology of the region, (2) a brief section on the population, and (3) the main section of eighty-one pages giving a summary of the pathology of East Africa. The author divides the diseases encountered into those which are typically tropical and those which are not. The tropical diseases include malaria, trypanosomiasis, leprosy, frambesia, certain helminthiases, relapsing fever, leishmaniosis, smallpox, tropical ulcer and a few rarer conditions. The nontropical diseases include (1) general infectious diseases, such as whooping cough, measles, chickenpox, mumps, scarlet fever, diphtheria, tuberculosis, venereal diseases, respiratory diseases, typhus fever, dysentery, rheumatic polyarthritis, anthrax, cerebrospinal meningitis, poliomyelitis, tetanus and certain disorders of the eye, and (2) noninfectious conditions, such as tumors, mental diseases and deformities. It is obvious that, covering so large a field, detailed accounts cannot be given of each condition. The author considers malaria the most frequent disease of the region. In some districts yaws is universal and the author states that the tertiary lesions cannot be distinguished from tertiary syphilis. The illustrations are excellent and the report will be of wide interest not only to investigators interested in tropical diseases but to others interested in the occurrence of the so-called nontropical diseases in tropical countries.

Preventive Medicine. By Mark F. Boyd, M.D., M.S., C.P.H. Fourth edition. Cloth. Price, $4.50. Pp. 532, with 150 illustrations. Philadelphia & London: W. B. Saunders Company, 1932.

The fourth edition of this well known book requires little comment except to point out the changes from the previous edition. These changes are relatively slight but rather important to make in order that the new edition may be brought down to date. The sections on malaria, undulant fever, trachoma, scarlet fever, diphtheria and poliomyelitis have been changed to conform to recent knowledge and public health practice. These changes are mentioned merely as examples. It is evident that all the material has been carefully revised. Some unnecessary material has been omitted, of which the section on fumigants may be mentioned. The book has found a wide use and should continue to do so.

Le mycosis fongoïde: Granulomes fongoïdes et sarcomes fongoïdes. Par le Dr S. Laplère. Paper. Price, 30 francs. Pp. 122, with 20 illustrations. Paris: Masson & Cie, 1932.

The literature is reviewed, along with personal observations and experimentation, and the work is divided into historical, clinical, histologic, experimental, hematologic, diagnostic and etiologic, followed by conclusions. The purpose of the work is to emphasize the necessity of considering mycosis fungoides as a distinct entity, although the author admits many similarities with leukosarcomas and lymphosarcomas. Mycosis fungoides comprises a series of disorders of the reticulo-endothelial system of the skin. Granuloma fungoides is an inflammatory reaction, and the tumor stage is the result of a neoplastic change. The systemic reaction of the patient is different in the two conditions. The granulomatous stage may change over into the tumor stage, and for that reason the author prefers to call mycosis fungoides a granulosarcoma. The clinical photographs are good but the photomicrographs are only fair. A bibliography is appended.

Practical Treatment of Skin Diseases with Special Reference to Technique. By Eduard Ahlswede, M.D., Asst. Physician, Clinic and Research Laboratory, Direction of Prof. Unna, Hamburg. Cloth. Price, $12. Pp. 770, with 77 illustrations. New York: Paul B. Hoeber, Inc., 1932.

This is an unusually complete presentation of the therapeusis of skin diseases that has many things to commend it. Combining as it does the therapy of the Unna school with that of some of the more important dermatologic clinics of America, it assumes almost an international aspect. Of particular value is the chapter on the pharmacologic action of the more important remedies employed in the local treatment of skin diseases. The chapter on the technic of treatment gives explicit, detailed instructions with proper emphasis on the various procedures of physical therapy used by dermatologists. The long chapter on the treatment of individual diseases of the skin is arranged alphabetically and is replete with diagnostic and therapeutic hints and with valuable formulas. A few minor deficiencies may be mentioned. Only half a page is devoted to medical and surgical diathermy and one page to radium therapy, in which it is obviously impossible even to outline these important subjects. The large number of prescriptions scattered throughout the volume will be found by many to be confusing, and greater selectivity might have been exercised. Barring these minor criticisms one can safely say that the author has done a valuable piece of work, both for the general practitioner and for the specialist.

Le p_H en dermatologie. Par Louis Spillmann, doyen de la Faculté de médecine de Nancy, Marcel Verain, chef de laboratoire de la Faculté de médecine de Nancy, et Jacques Weis, chef de clinique dermatologique de la Faculté de médecine de Nancy. Paper. Price, 32 francs. Pp. 195. Paris: Masson & Cie, 1932.

This book is divided into introduction, historical review, physiologic and physiopathologic relation, diagnostic methods, general results, attempts at pathogenic interpretation, observations and conclusions. A bibliography is appended. The author's theme is the existence of a disturbance of acid-base equilibrium in 93 per cent of cases of eczema, seborrheic dermatitis, urticaria, the prurigos, the erythrodermias, dermatitis herpetiformis and erythema multiforme. Acidosis existed in 20 per cent of cases, and alkalosis in 73 per cent of cases. There is a parallelism between the evolution of the dermatosis and the acid-base disturbance. Blood studies furnish prognostic aid and herald recurrence. Acidosis is easily relieved by sodium bicarbonate or sodium thiosulphate. Alkalosis is less easily relieved by phosphoric acid, calcium chloride and autohemotherapy. The author was able to effect 43 per cent of cures and 18 per cent improvement.

Reflex Activity of the Spinal Cord. By R. S. Creed, D. Denny-Brown, J. C. Eccles, E. G. T. Liddell and C. S. Sherrington. Cloth. Price, $3.25. Pp. 183, with 71 illustrations. New York & London: Oxford University Press, 1932.

No better description of the purpose of this book can be made than that given by the authors in the preface: "This small book attempts on behalf of the student of medicine—indeed, on behalf of any student interested in the physiology of the nervous system—a concise account of elementary features of reflex mechanism, as illustrated particularly by the mammalian spinal cord. . . . To that end the plan here followed is to introduce and describe seriatim a number of reflexes typically obtainable from the mammalian preparation. These in every instance are reflexes which take expression in the skeletal musculature, predominantly in that of the limbs. The description and discussion given of them in each case are directed mainly toward analysis of the working of the reflex mechanism. In that connection an object of study kept in view throughout is the individual motor unit as a basal element of the reflex response. Improved technic provides more precise observations than were formerly possible of reflex time relations and reflex quantities of effect both mechanical and electrical; hence the interpretation of reflex response in terms of the motor unit itself becomes a tangible objective." The book is a worthy supplement to Sherrington's "The Integrative Action of the Nervous System." Although it reflects the view of Sherrington's school, liberal references to other opinions are included and some former views are modified. The contents of the book include chapters on the reflex arc, the spinal gray matter, the flexor reflex, the stretch reflex, reflexes in extensor muscles

other than postural reflexes, central inhibition, and lower reflex coordination. The chapter on lower reflex coordination may be used as an illustration of the comprehensiveness of this work. Here are considered concealed reflexes, reversal of reflex effect, rebound, quantitative adjustment of reflex contraction, grades of reflex excitations, subliminal fringes, subtetanics, recruitment, plurimuscular combination in the reflex, reciprocal innervation, speed of movement, tremor, rhythmic reflexes, stepping, decerebrate rigidity, the spinal state, spinal shock, and the controlled drive of the motoneuron. The subject matter is presented in a simple, understandable, easily read form, in logical sequence, and assembles into a single source the present knowledge of the subject. The book should be valuable to all interested in the physiology of the nervous system and its relation to clinical medicine.

Anatomie des lymphatiques de l'homme. Par H. Rouvière, professeur d'anatomie à la Faculté de médecine de Paris. Cloth. Price, 150 francs. Pp. 489, with 129 illustrations. Paris: Masson & Cie, 1932.

The author of this work on the lymphatics of the human body, Professor Rouvière, has spent seven years in a review of the field. He and a dozen men in his laboratory have checked up the results reported by previous investigators by repeating their injections and observations. They have made more than 2,000 new preparations. The literature has been thoroughly reviewed, and the text that is now appearing is the result of this work. The illustrations, mostly by Moreaux, set forth clearly the facts of greatest importance. A few general principles, stated in the first eight pages, might well have been extended and more explanations from the standpoint of evolution and function given. Among the interesting topics treated are: (1) the frequency of anastomoses across the median line; (2) the rather facile dilatation of lymph vessels behind any obstacle, such as an inflamed gland, and the resulting reversal in the direction of lymph flow in such areas, because in the dilated vessels the valves are no longer competent; (3) the report by many investigators of lymph vessels flowing to the blood stream without any interruption by lymph glands (Rouvière and his co-workers have found these frequently in dogs but never in man, except in one instance in which a lymph vessel from the thyroid gland opened into the thoracic duct); (4) the fact that the atrophy of old age is incomplete: it does not lead to a disappearance of lymph glands. Though they shrink, they continue to exist; and they may enlarge again in cases of disease or infection. Clinicians and students of anatomy will find in this work a very satisfactory source of information on the subject. The interest in defensive mechanisms and especially in the ways by which carcinoma spreads and the interest in the life history of lymph cells will give to the book a special appeal at this time.

Minor Surgery. By Frederick Christopher, S.B., M.D., F.A.C.S., Assistant Professor of Surgery at the Northwestern University Medical School, Chicago. With a foreword by Allen B. Kanavel, M.D., F.A.C.S., Professor of Surgery at the Northwestern University Medical School. Second edition. Cloth. Price, $10. Pp. 998, with 687 illustrations. Philadelphia & London: W. B. Saunders Company, 1932.

The appearance of a new edition so soon after the first is sufficient indication of the popularity of this book. If the first edition was received so favorably, there is no question that this one will have a still greater success.

Although this volume is 300 pages longer than the first, the scope of the book has not been enlarged. A good deal of new material has been added in the sections on vascular diseases, fractures, postoperative care, electrical injuries, chest injuries and local anesthesia. More important, however, is the fact that most of the results of important clinical and experimental researches pertaining to the subjects discussed have been added.

The plan of the book remains the same as before. The first seven chapters cover such general topics as wounds, foreign bodies, furuncles and carbuncles, burns and electrical injuries, circulatory disturbances and gangrene. The remainder of the text is a regional minor surgery. Injuries, infections, tumors and deformities are considered, beginning with the head. The same scheme is used in the discussions of the neck, extremities, anus, rectum and genitalia.

The book is unusually well written and is full of information presented in a simple manner. The procedures described are easily followed. Numerous good illustrations add to the clarity of the text. It would be difficult to evaluate the different sections of the book, but the chapters on the injuries and infections of the upper extremities are excellent. Similarly the chapter on minor surgical technic is good, and the section dealing with the surgical intern is unique and valuable.

Lærebog i Infektions-Patologi og beslægtede Omraader. Del I. Infektion og Immunitet. Del II. Specielle Infektioner. Af Oluf Thomsen, Dr. med. Prof. v. Universitetet. Paper. Pp. 420 & 479, with 37 illustrations. Copenhagen: Levin & Munksgaards Forlag, 1932.

The author is professor of general pathology in the University of Copenhagen and well known as a writer on immunologic topics especially. The volume is intended as a textbook for medical students and as a handbook for physicians. It is peculiar in that it deals essentially with the etiology and immunology of infectious diseases, including certain closely related topics. The strictly clinical side of infectious diseases does not receive systematic consideration. This is true also of their pathologic anatomy. The first part is devoted to the general subjects of infection and immunity. It is an excellent introduction to the study of infectious diseases. There are short chapters also on inflammation, fever, chemotherapy, allergy, blood grouping and protein therapy. The second part takes up the etiology, epidemiology and immunology of the individual infectious and parasitic diseases, not only of temperate but also of tropical regions. The writing, necessarily condensed, is clear and systematic. An enormous amount of reliable information is offered. There are no references to the literature, but the discussion in general follows the historical method.

Physical Therapy. By John S. Coulter, M.D., Assistant Professor of Physical Therapy, Northwestern University Medical School, Chicago. No. 8, Clio Medica: A Series of Primers on the History of Medicine. Edited by E. B. Krumbhaar, M.D. Cloth. Price, $1.50. Pp. 142, with 15 illustrations. New York: Paul B. Hoeber, Inc., 1932.

This is a history in some 15,000 to 20,000 words of the progress of physical therapy. It is well written, full of information heretofore not generally available, illustrated with excellent pictures taken from ancient sources, and supplemented by a good bibliography and an index. Much of the scientific physical therapy is of comparatively recent origin. The sections dealing with Finsen, Curie and the modern observers are found to be just as fascinating and interesting as those concerning the physical therapy of the ancient Greeks and the medieval English.

Formulaire Bouchardat. Par A. Desgrez, professeur de chimie minérale et organique à la Faculté de médecine de Paris, et F. Rathery, professeur de clinique thérapeutique à la Faculté de médecine de Paris. Thirty-seventh edition. Cloth. Price, 40 francs. Pp. 986. Paris: Librairie Félix Alcan, 1932.

This useful French compendium of proprietary and nonofficial remedies is now in its thirty-seventh edition. Those who find it necessary to read French literature with its multitudinous references to proprietary concoctions of this and that will find Bouchardat's formulary helpful in describing the ingredients of preparations. The book is divided into chapters on such topics as biologic methods of treatment—including serotherapy, vaccination, bacteriotherapy and electrotherapy—poisons and their treatment, accidents, and psychiatric therapy. The index is complete.

Studies in the Photo-Activity and Therapy of the Tungsten-Titanium Arc. By J. Burdon-Cooper, M.D., B.S., B.Sc., Doyne Lecturer and Medal, Oxford Ophthalmological Congress, and Arthur Roberts, T.D., F.R.C.S.E., M.R.C.S., Consulting Aural Surgeon, Royal Berkshire Hospital. Cloth. Price, $3.50. Pp. 85, with illustrations. New York: William Wood & Company, 1931.

Writing in an interesting style, the authors have recorded results of an investigation on the photo-activity—experimental and clinical—of the tungsten-titanium arc. They did not have access to radiometric laboratory equipment but used the spectrophotographic method with unusual skill. Data and photographs presented in the book tend to prove that the radiations from the tungsten-titanium arc penetrating ox hide (with the hair removed) have bactericidal actions equivalent, or nearly equivalent, to the bactericidal action of the same radiations passing through a quartz filter (3 mm.). The writers believe that the tungsten-titanium arc generates radiation of extreme

penetrative power and that the heat influences the penetrative power of the photographic effect, e. g., ultraviolet rays, the inference being that the radiations will penetrate the human skin.

Spurred on by the success of the radiation from the tungsten-titanium arc after other methods had failed to clear up vitreous prolapse, imperfect apposition of wound margins and iritis, following extraction of a cataractous lens, the authors' interests were aroused in rays generally, and they were stimulated to ascertain the causes determining such a result.

In part 2 the clinical aspect of the investigation is considered. After describing the lamp, the investigators cite certain illustrative cases of eczema, acne, alopecia, chilblains and asthma that were improved by irradiation. Furthermore, circulatory and rheumatic conditions and general debility are said to be greatly benefited by the light. A more scientific paper would have been added to medical literature had the investigators followed their inclination, as hinted at in the preface, and tabulated the failures as well as the successes. The writers offer no scientific evidence to substantiate their belief that the general irradiation of the body will improve the resistance to infection or prevent the contraction of influenza or colds.

Materia Medica of Pharmaceutical Combinations and Specialties. By U. B. Narayanrao, Registered Medical Practitioner, Bombay. With an introduction by G. V. Deshmukh, M.D., F.R.C.S., Professor, G. S. Medical College, Bombay. Cloth. Price, Rs. 2-8. Pp. 249. Bombay: Rayan Pharmacy, 1932.

This is an attempt to secure for the East India physician information on some of the "2,000 more important specialties that are daily being prescribed by the doctors, and that are prepared by well known manufacturers of the world." No secret remedies are given a place in the book unless the makers gave at least the most important ingredients. The book has not, of course, the value or authoritativeness of New and Non-official Remedies, as critical discussion is entirely lacking.

Doctor's Income and Expense Record. Income and Expense Record of Doctor..... for the Year from..... 193.... to .....193.... Cloth. Price, $3. Pp. 52. Michigan City, Indiana: Hill Publishing Company, 1932.

This combination includes a bound book with some nine pages of text and forty-two pages of blanks. The text discusses methods of keeping books, listing income, deductible and nondeductible expenses, assets and liabilities, explaining the nature of each type of expenditure and income. There are pages for recording cash payments, cash receipts and earnings, professional income, other income and expenses and summary pages for the year. Associated with the bound book are tablets of sheets providing a daily record of charges, cash service, amounts received and miscellaneous receipts. The entire set-up is simple and may be helpful to physicians whose book-keeping is not too complicated.

Deutsch-englisches medizinisches Wörterbuch. Von Dr. Moritz Kaatz. Part 2 of English-German and German-English Medical Dictionary by Joseph R. Waller, M.D., and Moritz Kaatz, M.D. Sixth edition edited by Dr. Franz Von Braitenberg. Cloth. Price, 7 marks. Pp. 238. Vienna: Franz Deuticke, 1932.

This dictionary provides 227 pages of English definitions of German medical words, and several appendixes of abbreviations, word endings and tables of weights and measures.

International Studies on the Relation Between the Private and Official Practice of Medicine with Special Reference to the Prevention of Disease. Conducted for the Milbank Memorial Fund by Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Volume III: England and Wales, Scotland, Ireland. Cloth. Price, $5. Pp. 558. Baltimore: Williams & Wilkins Company; London: George Allen & Unwin, Ltd., 1931.

The third volume of Sir Arthur Newsholme's contributions includes studies of England, Wales, Scotland and Ireland. The organization of medical practice in England is highly complicated because of the introduction of sickness insurance and various other socialized schemes. Dr. Newsholme reveals the methods of operation of these plans in various towns and villages. He feels that the entire system is today an experiment subject to constant modification and change with experience. Again he reiterates the difficulty of comparing the mortality rates in various countries.

Miscellany

THE HISTORY OF BLOOD TRANSFUSION

The first transfusion of blood in the modern sense is said to have been attempted, about 1490, at Rome. Pope Innocent VIII lay dying from old age. A Jewish physician seems to have tried to rescue the pontiff by transfusing into his veins the blood from three boys. The testimony as to what actually was done is conflicting, but the various versions seem to agree that the boys died, the pope's death was not stayed, and the physician fled after the failure of the experiment.

Zimmerman and Howell, in the September issue of the *Annals of Medical History*, note that transfusion was mentioned in writings of the fifteenth and early sixteenth centuries. Hieronymus Cardamus (1505-1576) and Magnus Pegelius (1593) mentioned the possibilities of transferring blood directly from the vessels of one person to those of another. Andreas Libavius (1615) who first definitely advocated blood transfusion, described a technic similar to that used until recently. The actual history of blood transfusion necessarily begins with the discovery of the circulation in 1616. Christopher Wren, an astronomer and architect, in 1656, injected medicaments into the veins of dogs, by means of bladders fastened to quills. The first successful transfusion of blood from one animal to another was done in 1665 in Oxford by Richard Lower, a physician, who united the artery of one dog with the vein of another by means of quills or silver tubes. The experiment was repeated before the Royal Society, and that group outlined further experiments. Reports of these achievements spread, and in the next year the first human transfusion was done in Paris by the philosopher and mathematician Jean Baptiste Denis. The patient was a youth suffering from an obscure fever, who had been subjected to so many venesections that he lay in a state of exhaustion. Following the administration of 9 ounces of blood from the carotid artery of a lamb, astonishing improvement resulted.

The second transfusion performed by Denis and his assistant Emmeris was in the nature of an experiment to which a healthy man consented for a financial consideration. Following a venesection of 10 ounces, about twice that amount of blood was permitted to flow into his vein from the femoral artery of a lamb. The operation was completed with dispatch, the patient felt no untoward symptoms, and instead of going home to bed as instructed he went to a public house with friends to dispose of his easily earned money. Denis became renowned as a transfuser, and a storm of opposition, hatred and jealousy arose, in which religion, metaphysics and personal animosity were invoked. A third transfusion on a moribund patient was effective only in delaying death a number of hours, and the fateful fourth case brought an upheaval that buried Denis and his favorite operation for a century and a half. The patient was insane and transfusion had been done twice by Denis, apparently with alleviation of the mania. Following the second transfusion "his arm became hot, the pulse rose, sweat burst out over his forehead, he complained of pain in the kidneys and was sick at the stomach. The next day the urine was very dark, in fact black." A third transfusion, undertaken at the request of the patient's wife, was fatal. The enemies of Denis capitalized this misfortune. They conspired with the widow to bring action against the transfuser on a charge of murder. A long legal battle ensued. Denis was exonerated of the charge but further transfusions were prohibited, except by the approval of the Faculty of Medicine of Paris. As the chiefs of the faculty were the leaders of the opposition to transfusion, this decree, in effect, prohibited further transfusion. About ten years later (1678) experiments with transfusion on human beings were prohibited by an edict, thus closing this chapter in the history of blood transfusion as far as France was concerned. Nov. 23, 1667, Lower and King in England performed a human transfusion using sheep's blood, which was well tolerated. A second transfusion on the same subject several weeks later was successful. In Germany, Balthasar Kaufmann and Gottfried Purmann treated a case of leprosy and two scorbutic soldiers by transfusions of lamb's blood. Riva and Manfredi, in Italy, performed two human

transfusions with sheep's blood, but the magistrates in Rome were so impressed with the action of the Parisian court in the case of Denis that they also forbade transfusion from animal to man.

Zimmerman and Howell note that among the cases in which transfusion was performed during this first period there were none of acute anemia. The operation was undertaken to cure advanced lung and intestinal disease, to restore youth to the senile, or to bring the insane to reason. In fact, it was the possible mental effects of the transfused blood that seems to have appealed most to the early investigators.

With such naive and irrational selection of cases for transfusion, reactions were often severe, and the phenomena attendant on the injection of incompatible blood were beginning to be recognized. For 150 years, the operation of blood transfusion fell into complete desuetude, except for an occasional case report. Writers lamented the fact but did nothing constructive to bring the operation back into favor. In 1792, Dr. Harwood performed several animal transfusions at Cambridge. In 1796, Erasmus Darwin, grandfather of the illustrious Charles, advocated transfusion in carcinoma of the esophagus and other conditions in which nutrition was inadequate. There is no record that he performed the operation. Paul Scheel of Copenhagen published a monograph in 1802, containing a review of the literature on infusion and transfusion compiled from original sources. Professor Rosa of Modena experimented in 1783, under the direction of Scarpa and found that blood vessels were able to adapt themselves to increased blood volumes, so that venesections which had been considered an indispensable preliminary then were shown to be superfluous. Prevost and Dumas (1821) found that exanguinated animals could be revived by the transfusion of blood, while the injection of serum or of water heated to 38 C. was ineffective. Blood from animals of another species was less effective than was homologous blood, and though life was restored, the animals succumbed within six days. They concluded that the operation was "unfortunately too celebrated, that it had been abused in an ignorant and barbarous century, and that it deserved to be abandoned" until the effective principles in the blood were better understood.

REDISCOVERY BY BLUNDELL

The rediscovery of blood transfusion in the nineteenth century was the contribution of James Blundell (1790-1877), the London physiologist and obstetrician. In careful scientific experiments, he found that death from hemorrhage could be prevented by the transfusion of blood from animals of the same species, even after all signs of life had disappeared. Blood from animals of another species he found unsuitable, since the temporary resuscitation it effected was followed by death in several days. Direct transfusion required an operation on the artery of the donor, which in those days was formidable. Blundell therefore studied the effect of passing blood through a syringe. He found that blood thus handled lost none of its life-giving properties, that venous blood was as satisfactory as arterial, and that it was not only unnecessary but undesirable to restore as much blood as had been lost. He devised a modification of the simple syringe which had a three-way valve similar to those in use today. This, and his later instruments, were the first of the long series of instruments invented for indirect transfusion. Blundell applied the results of his studies to the human body, and to him belongs the credit of performing the first transfusions with human blood. His first four attempts were desperate resorts in dying patients, and all failed. He persevered, and his efforts were rewarded by the resuscitation of several women when death from postpartum hemorrhage seemed certain. He performed the operation eleven times, a number greater than that of any of his predecessors; and he succeeded not only in bringing the operation of transfusion back into notice but also in placing it on a firm clinical basis, with rational indications and a scientific background.

Following the example of Blundell, a number of other surgeons performed transfusions, chiefly in England. Phlebitis, both in the recipient and in the donor, had constantly to be feared. Reactions were frequent, and sometimes death occurred even when human blood was used. Technical difficulties, particularly those due to coagulation of the blood, were many. Progress was being made, however. Prevost and Dumas had experimented with the transfusion of defibrinated blood and with blood rendered incoagulable by the addition of caustic soda. These experiments were elaborated by Dieffenbach (1826), who found that fibrin suspended in water or serum had no power to restore life after hemorrhage. Bischoff, in 1835, showed that whole blood injected into animals of another species was toxic but defibrinated blood of the same type, injected into those animals, was well borne, and that it was effective in reviving the animal after exhaustive bleeding. He concluded that the fibrin was the toxic agent and advised the transfusion of only defibrinated blood. The first actual transfusion with defibrinated blood was done in 1847, by Larsen (at the suggestion of Panum).

While the application of transfusion in various diseases was being held *sub judice*, its indication in hemorrhages, particularly those following childbirth, had been established, and its use during the half century following the publication of Blundell's work was largely limited to cases of this type. In 1859, Edward Martin collected fifty-seven cases of transfusion for postpartum bleeding, in forty-five of which recovery was reported. None of the fatalities, however, were attributed to the transfusions. Belina Swiontkowski, ten years later, collected 155 cases of blood transfusion.

PHYSIOLOGIC BASIS

Studies were being made about this time by Magendie and Brown-Séquard, by Jakob-Mueller and by Panum, Landois and Mueller, on the physiology of the blood, on the cause of febrile reactions following transfusion and on the fate of heterologous blood corpuscles. Creite (1869) described the clumping of human red blood corpuscles, when placed in the serum of cats, dogs, sheep or birds. Landois (1875) found that serum of one species agglutinated and dissolved the corpuscles of other species. He explained the hemoglobinuria following heterologous transfusion on this basis. These investigations led to the conviction that the transfusion of foreign blood was dangerous and that only human blood should be used. Clinically, the field of indications was extended in 1864 to the use of transfusion in carbon monoxide poisoning, and later, with less success, in poisonings of other types, sepsis and leukemia. Braxton Hicks, in 1868, treated blood with sodium phosphate to retard coagulation during transfusion. Innumerable instruments were devised, many of them bizarre and complicated, to facilitate the transfusion of both whole and defibrinated blood.

Toward the end of the third quarter of the nineteenth century, the interest in transfusion culminated in a wave of exaggerated enthusiasm, in which the procedure was heralded as ushering in "a new era in medicine." With the increased popularity came a departure from principles that had become firmly established. Instead of limiting the operation to cases of anemia or acute hemorrhage, it was applied to a host of vague infectious and debilitating diseases, including phthisis, as well as to "the burnt, the uremic, the syphilitic and the mad." In spite of the frequently demonstrated dangers of heterologous transfusions, animal blood was again widely used. The Russian Gesellius urged the use of sheep's blood. Oscar Hasse presented the subject of lamb blood transfusion before the German Surgical Society Congress of 1874, with a report of thirty-one cases representing a multitude of diagnoses. His technic, like that of Lower and Denis, consisted of direct transfusion from the carotid artery of the lamb to the cubital vein of the patient, except that he used glass tubes instead of quills or silver tubes. The transfusion was continued until the inevitable reaction began, at which time it was interrupted. The symptoms of these reactions he described in detail; the fatalities were ascribed to causes other than the transfusion. The presentation found little favor at the congress, and the cynical jest went round that "for a lamb blood transfusion, the presence of three sheep was always necessary."

Hueter, in 1870, thought he had discovered a method of eliminating the dangers of transfusion and predicted the "triumphant entrance" of the procedure into the ranks of everyday operations. His departure consisted of the injection of defibrinated blood peripherally, into the radial or posterior tibial arteries. Kuester transfused animal blood into the artery, after the suggestion of Hueter, and later performed the first direct artery-to-artery transfusion with human blood. But the arterial

operations were, naturally, more formidable and carried greater danger, and they failed to find general adoption. About this time (1875-1880), infusion with physiologic solution of sodium chloride in the treatment of acute anemias and shock was demonstrated and its superiority over blood transfusion was unquestioned, for donors were unnecessary, the technic was simple, the solution did not coagulate, and, above all, it was safe. Infusion with physiologic solution of sodium chloride rapidly supplanted blood transfusion, and the latter was once more virtually abandoned until the beginning of the present century.

During this interval, great advances were made in the medical sciences. Bacteriology had become established, and asepsis was introduced in surgery, thus largely eliminating the danger of infection during transfusion. Immunology also was growing rapidly. Bordet found that blood corpuscles injected into the blood stream of an animal of another species called forth antibodies in the serum which were hemolytic for those corpuscles. Ehrlich and Morgenroth demonstrated specific hemolysins in normal serums, for corpuscles of other species. Blood coagulation was being studied by Schmidt, Arthus, Pages, Hammarsten and others; it was found that shed blood could be kept from clotting only by avoiding contact with tissue juices or foreign surfaces. Freund demonstrated that coagulation was delayed if blood was received in vessels coated with petrolatum, and Bordet and Gengou employed a coating of paraffin for the same purpose. The application of these discoveries to blood transfusion made it mandatory that only human blood be used and that, so far as possible, the blood should remain in contact with only intact blood vessel endothelium.

DISCOVERY OF BLOOD GROUPS

In 1900 Landsteiner (and, independently, Shattuck) made the momentous discovery which was recently awarded the Nobel prize, namely, that human blood contains iso-agglutinins, capable of agglutinating other human red blood corpuscles, and that human blood is divided into three groups with regard to the agglutinating reactions. Decastello and Sturli (1902) added a fourth group. Hektoen (1907) was the first to point out the significance of iso-agglutinins in human blood transfusions, and their relation to the reactions and hitherto unexplained fatalities from the injection of human blood. Jansky worked out the reciprocal agglutination reactions of the four groups and classified them accordingly. Three years later, Moss published his classification, which differed from Jansky's only in the numbers given the groups. The Moss classification was widely adopted, and consequently the two classifications were in general use simultaneously. This was both confusing and dangerous. In 1921 a committee representing organizations of American immunologists, bacteriologists and pathologists reviewed the question and concluded: "As further confusion and the possibility of accident may be avoided by the universal use of one classification, it is recommended unanimously on the basis of priority that the Jansky classification be adopted."

Nevertheless, the two classifications have still persisted (1931). Recently von Dungern and Hirschfield suggested that the Landsteiner classification be adopted, in which the blood groups are named O, A, B and AB. This classification has the advantage of priority and it is based on the presence of the antigenic structures of the red blood cells.

The introduction of these important immunologic principles into surgical practice was rather slow. Ottenberg, who in 1908 developed clinical methods for typing human blood, was the first to apply agglutination tests in human transfusions. He found that the accidents in transfusion due to hemolysis or agglutination of the donor's blood cells by the patient's serum, or vice versa, could be absolutely excluded by careful preliminary blood tests. This has been adequately confirmed, and the last great danger in transfusion is eliminated.

TECHNICAL ADVANCE

Having been placed on a secure footing, blood transfusion was established in the position it now occupies by the World War, with its enormous demand for transfusions in cases of hemorrhage and shock. The only remaining difficulties had been technical in nature, and in the past twenty years these have been largely eliminated. Innumerable methods and modifications have been introduced to facilitate the procedure, most of which have enjoyed no more than transient popularity. Many of them were complex, and time has verified the declaration by Hueter in 1870 that "The simplest is the best."

Carrel perfected his method of blood vessel anastomosis in 1905, and for several years transfusions were done by uniting the artery of the donor with the vein of the recipient by the suture method. This offered a continuous, unbroken endothelial surface, thereby preventing contact of the blood with any foreign substance. It required a formidable operation, however, and a delicacy of technic that limited its use to surgeons experienced in blood vessel surgery. Crile, in 1907, introduced his method of cuffing the artery back over a cannula and tying the vein over it. This greatly facilitated the operation, and, together with its many modifications (Elsberg, Jeger, Soresi), was the preferred method for years. To simplify the procedure still further, recourse was again had to the simple cannula (Brewer, Morel), cylindric like the tubes used by Lower and Denis in the earliest transfusions. Bernheim (1912) described a set of two tubes, one for the artery and one for the vein, which fitted into each other. This is almost identical with the first method of transfusion proposed by Libavius in 1615. All these methods of direct transfusion, however, required the sacrifice of an artery of the donor. Moreover, it was impossible to measure the amount of blood transfused, there was danger to the donor in infectious cases, and mishaps due to clotting of blood or severing of the anastomosis by motion on the part of either patient or donor were frequent. With the advent of simple and reliable indirect methods of transfusion, the direct methods were less frequently employed, until today they are no longer in use.

In 1911 Curtis and David applied the principle demonstrated years before, that blood introduced into vessels coated with paraffin remains uncoagulated for some time. Their apparatus consisted of a paraffin-coated vessel, connected with a syringe and having two outlets; through one of these the blood was drawn in from the vein of the donor, and through the other it was injected into the patient. Two years later Kimpton and Brown utilized the same principle in the development of the Kimpton tube, which was subsequently modified by Percy, Vincent and Schlaepfer and is still rather widely used today.

In the same year (1913) Lindeman revived a method described by Ziemessen in 1892, consisting of the use of multiple large syringes, which were successively filled from a cannula in the vein of the donor and emptied through a second one in the vein of the patient. With slight modification, this method is used at present. It is somewhat cumbersome and requires several operators; otherwise the blood is likely to clot in the syringes or needles. To eliminate these possibilities and to simplify the procedure, devices have been suggested, some of which were equipped with valves permitting the alternate aspiration and injection of blood, without the syringes being disconnected. These resemble, in general, the many appliances developed by Blundell and his successors during the nineteenth century. McGrath (1914) revived the once popular Aveling apparatus, substituting for the original device a large rubber bulb with two lateral tubular prolongations to be inserted into the veins of the donor and the recipient. Alternate compression of the tubes permitted repeated aspiration from the donor and injection into the patient. DeLee substituted a syringe with a T-tube attachment for the same purpose, as, indeed, had Curtis and David in 1911, with their original paraffin-coated Y-tube. Unger (1915) devised a four-way valve syringe attachment, in which the outlets to the donor and recipient were alternately connected with the syringe and with a reservoir of saline or citrate solution. Many variations of these instruments (Bernheim, Janes, Scannell) have been employed, some being used today.

The greatest difficulty with the methods of transfusion was the clotting of blood in the apparatus. Attempts have been made for a century to render blood incoagulable by physical or chemical treatment. The transfusion of defibrinated blood was largely abandoned following the work of Koehler, in 1877, who demonstrated that blood so treated contained an excess of fibrin ferments, which were also a potential source of coagulative changes. Although Fuld, Morawitz and others showed that these harmful effects could be overcome, the use of defibrinated blood for transfusion has been limited in the modern period.

Landois in 1892 suggested the use of hirudin to keep the blood from clotting, and Satterlee and Hooker, after a comprehensive study of the various anticoagulants, attempted to use this substance. The difficulty of obtaining pure and reliable preparations of hirudin and the narrow range between the effective and the toxic dose of the drug prevented this method from wide usage. Hustin of Belgium, in 1914, reported experiments on the use of sodium citrate and dextrose in preventing the coagulation of blood. In the following year, Agote of Buenos Aires and Lewisohn and Weil independently advocated the use of sodium citrate alone. This method made the operation simple, safe and practical; transfusions could now be done by the surgeon without specially trained assistants, with little inconvenience to the donor and without disturbing the patient. During the war the citrate method became the standard practice in military service, and since that time it has been in wide use. Although there is some difference of opinion as to the incidence of increased reaction, the recuperative value and the antibody content of citrated blood, it has been adequately demonstrated that the drug is nontoxic in the concentration necessary to keep the blood incoagulable (0.2 per cent).

Finally, Zimmerman and Howell say that the last chapter in the story of blood transfusion has not yet been written. Its history covers three centuries of strange vicissitudes, of a popularity which ebbed and flowed, and of the eventual recognition of its value and limitations. Almost a myth to the ancients, the transfusion of blood is today firmly established as a practical therapeutic measure, securely based on scientifically demonstrated facts.

Medicolegal

Regularity of Revocation Proceedings

(In re Van Hyning (Mich.), 241 N. W. 207)

The Michigan board of registration in medicine, after notice and hearing, revoked the license of the defendant, Van Hyning, on the ground that he had been guilty of grossly unprofessional and dishonest conduct, in that he had had professional connection with, and lent his name to, an unlicensed person, who had examined and diagnosed an alleged physical condition in a certain named person. Van Hyning appealed to the Supreme Court of Michigan.

The defendant contended that the notice served on him was insufficient to give the board jurisdiction. The notice, said the Supreme Court, was in writing and informed the defendant that he was required to appear at a certain time and place and there show cause why his certificate of registration should not be revoked. The charges were not stated as clearly and connectedly as they probably would have been if the notice had been drafted by a lawyer, but in proceedings of this kind it is not necessary that the charges be stated with that exactness required in court pleadings. It is sufficient if they inform the defendant with substantial certainty concerning the manner in which he has been guilty of unprofessional and dishonest conduct. In the present case, the court was of the opinion that the notice met these requirements. In any event, the defendant contended, the board was without jurisdiction, because it was not constituted in accordance with the medical practice act. That fact, however, did not nullify its action in revoking a license, for the board was, in the opinion of the court, a de facto board. Nor, said the court, in answering another objection by the defendant, is it necessary under the Michigan statutes that a physician be convicted in a court of criminal jurisdiction before the board may institute proceedings to revoke his license.

The defendant next contended that the provision of the medical practice act under which he was proceeded against is unconstitutional, because it gives the board no certain standard to guide it in revocation proceedings. The board cannot legally be clothed, said the court, with power to say what acts of professional misconduct shall constitute cause for revoking a license, but the legislature may by statute create a standard of conduct, under which the board may lawfully act. If the statute merely declared that a license might be revoked for unprofessional and dishonest conduct, it would be open to objection on the ground of uncertainty; but it goes further and defines "unprofessional and dishonest conduct" to be "having professional connection with, or lending one's name to an illegal practitioner." That definition leaves nothing to the judgment of the board as to what shall constitute cause for revocation and it definitely enough informs the defendant concerning the professional misconduct that may bring about a forfeiture of his license. Nothing more is necessary to satisfy constitutional requirements.

The order of the board revoking the defendant's license was affirmed.

Charitable Hospitals: Liability for Injury to Visitor.—The plaintiff's daughter was a patient in the defendant charitable hospital. While leaving the hospital after visiting her daughter, the plaintiff slipped and fell on the stairs and was injured. To recover damages for her injuries, she and her husband sued the hospital. It was alleged that the stairs were covered with some slippery substance; that the supervising nurse in charge of the hospital premises was negligent in not discovering the slippery substance and having it removed, and that the nurse's neglect was imputable to the hospital. The trial court refused to direct a verdict in favor of the defendant hospital, judgment was given in favor of the plaintiffs, and the hospital appealed to the supreme court of New Jersey. The New Jersey Court of Errors and Appeal, said the supreme court, held in *D'Amato* v. *Orange Memorial Hospital*, 101 N. J. Law 61, 127 A. 340, that such a charitable institution is by public policy not liable for injuries to patients, even pay patients, resulting from the negligence or carelessness of its physicians and nurses. Applying that principle, the patient herself in this case, even though a pay patient, could not have recovered damages if she had been injured by falling on the slippery stairs of the hospital. But the plaintiff, it was argued, might recover damages, because she was not a patient, but only a visitor. The plaintiff, said the supreme court, entered the hospital voluntarily and for her own purposes. She had no invitation from the defendant hospital, other than such as was implied from the privilege of visiting the sick, given by the rules of the institution. The opportunity thus afforded was part of the charitable service which the defendant was rendering to suffering humanity. Accepting the principle, as applied to a charitable hospital, that public policy denies to a patient injured through the negligence of a nurse the right to recover damages for her injury, the logic of the rule denies that same right to those who in visiting patients are injured from a like cause. The liability of the defendant hospital was not shown as a matter of law, and the trial court should have directed a verdict in favor of the hospital.—*Boeckel v. Orange Memorial Hospital (N. J.), 158 A. 832.*

Society Proceedings

COMING MEETINGS

American Society for the Study of Disorders of Speech, St. Louis, November 25-26. Dr. Samuel D. Robbins, 419 Boylston Street, Boston, Secretary.

American Society of Tropical Medicine, Birmingham, Ala., November 16-18. Dr. Henry E. Meleney, Vanderbilt University School of Medicine, Nashville, Tenn., Secretary.

Association of American Medical Colleges, Philadelphia, November 14-16. Dr. Fred C. Zapffe, 5 South Wabash Avenue, Chicago, Secretary.

Pacific Coast Society of Obstetrics and Gynecology, Los Angeles, December 8-10. Dr. Clarence A. DePuy, 230 Grand Avenue, Oakland, Calif., Secretary.

Porto Rico, Medical Association of, San Juan, December 9-11. Dr. P. Morales Otero, 12 O'Donell Street, San Juan, Secretary.

Radiological Society of North America, Atlantic City, November 28-December 2. Dr. Donald S. Childs, Medical Arts Building, Syracuse, New York, Secretary.

Society for the Study of Asthma and Allied Conditions, New York, Dec. 10. Dr. W. C. Spain, 116 East 53d Street, New York, Secretary.

Society of American Bacteriologists, Ann Arbor, Mich., December 28-30. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Southern Medical Association, Birmingham, Ala., November 16-18. Mr. C. P. Loranz, Empire Building, Birmingham, Secretary.

Southern Surgical Association, Miami, Fla., December 13-15. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, Madison, Wis., December 9-10. Dr. Frank R. Teachenor, 306 East Twelfth Street, Kansas City, Mo., Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

2: 97-136 (Sept.) 1932

Progress Toward Ideal Obstetrics. P. W. Toombs, Memphis, Tenn.—p. 97.
Acute Ileus. A. Ochsner, New Orleans.—p. 104.
Peptic Ulcer, from the General Practitioner's Standpoint. W. R. Carter, Repton.—p. 111.
Brill's Disease: Sporadic Typhus. C. P. Hayes, Elba.—p. 114.
Acute Abdomen, as Encountered by the Country Doctor. C. P. Gay, Geneva.—p. 117.
Recent Advances in Prophylaxis of Diphtheria: Toxoid. A. H. Graham, Opelika.—p. 122.

American Heart Journal, St. Louis

7: 695-832 (Aug.) 1932

Incidence and Significance of Deep Q Wave in Lead III of Electrocardiogram. J. Edeiken and C. C. Wolferth, Philadelphia.—p. 695.
*Heart Disease in American Negro of South. E. H. Schwab, Galveston, Texas, and V. E. Schulze, Rochester, Minn.—p. 710.
Electrocardiogram in Middle Life. J. Jensen, M. Smith and E. D. Cartwright, St. Louis.—p. 718.
*Ventricular Tachycardia: Interpretation of Nature of Its Mechanism. D. Davis, Boston.—p. 725.
*Cardiac Rupture with Perforation of Interventricular Septum: Report of Two Cases. W. Freeman and E. D. Griffin, Washington, D. C.—p. 732.
Blood Pressure and Electrocardiogram in Experimental Pericardial Effusion. Margaret Foulger and J. H. Foulger, Cincinnati.—p. 744.
Partial Bundle-Branch Block. L. N. Katz, W. W. Hamburger and S. H. Rubinfeld, Chicago.—p. 753.
Possible Intranodal Block: Report of Cases. E. B. Bay and W. Adams, Chicago.—p. 759.
Incidence and Development of Hypertension and Heart Disease in Railroad Employees. J. C. Parsons, Creston, Iowa.—p. 767.
Tuberculous Pericarditis with Effusion Treated by Means of Pneumopericardium: Case. G. W. Thomas, Boston.—p. 771.
Aneurysm of Aorta Producing Pulmonary Stenosis and Bundle-Branch Block. J. H. Crawford and J. A. DeVeer, Brooklyn.—p. 780.
Brain Abscess (Paradoxical) in Congenital Heart Disease. M. A. Rabinowitz, J. Weinstein and I. H. Marcus, Brooklyn.—p. 790.
Light Weight Portable Electrocardiograph. H. Mann, New York.—p. 796.
Portable Electrocardiograph Giving Direct Ink Tracings. P. Duchosal and R. Luthi, Geneva, Switzerland.—p. 798.

Heart Disease in American Negro.—Schwab and Schulze state that in view of the fact that heart disease in the Negro as compared with the white race is of greater incidence, occurs at a younger age, pursues a more rapid course, and has a higher mortality rate, the opinion is offered that the cardiovascular system of the American Negro of the South is inferior to that of the white race, and is more vulnerable to insult whether this be applied as an infection, a degeneration, a toxemia, or in the form of the stress and the strain that are incident to the complexities and modes of modern occidental civilization.

Ventricular Tachycardia.—Davis presents an interpretation of the mechanism of ventricular tachycardia. Its occurrence in healthy individuals is normally prevented by the control effected through the His-Tawara-Purkinje system of conduction, which distributes supraventricular impulses very rapidly to all parts of both ventricles and induces a uniform state of refractoriness sufficient to prevent the setting up of continuous runs of ectopic beats. Disease or drugs that depress the conducting tissues tend to interfere with this normal control and permit the development of circus movements in the ventricles. An analysis of the literature reveals the presence of disease or the use of drugs which depress the conducting tissues in a majority of the reported cases. Ventricular tachycardia resulting from digitalis is probably induced by its depressing action on the conducting tissues, and this factor must be considered together with hyperirritability of the muscle.

Cardiac Rupture with Perforation of Interventricular Septum.—Freeman and Griffin report two cases of perforation of the interventricular septum following coronary thrombosis. This rare condition should be suspected when there is superimposed on the picture of coronary occlusion a striking symptom complex consisting of (1) progressive harsh systolic murmur and thrill over the precordium, (2) gradual extinction of the aortic sound, and (3) marked disproportion between the force of cardiac action and the strength of the pulse. The mechanism seems plainly indicated. The septal perforation permits passage of blood from the stronger left ventricle to the weaker right through a gap with rough edges, reducing the stream that passes the normal aortic opening into the general circulation. Death may take place from pulmonary congestion and edema before the opening is large enough to divert sufficient blood from the systemic circulation to cause disappearance of the pulse. The condition may be distinguished from congenital malformation by the age and previous condition of the patient as well as the shorter survival period.

American Journal of Public Health, New York

22: 895-1025 (Sept.) 1932

Recent Advances in Fumigation of Ships. C. L. Williams, Staten Island, N. Y.—p. 895.
Ages of Health Officers in Relation to Professional Training. J. A. Ferrell and Pauline A. Mead, New York.—p. 904.
Studies on Ringworm Funguses, with Reference to Public Health Problems. L. Bonar and Alice Domsler Dreyer, Berkeley, Calif.—p. 909.
Health: Where Can It Be Taught? Clair E. Turner, Cambridge, Mass.—p. 927.
Medical Participation in Public Health Work. H. F. Vaughan, Detroit.—p. 933.
Projection Method for Demonstrating Particles Suspended in Fluid. J. A. Kasper and S. L. Simmons, Detroit.—p. 983.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

28: 145-270 (Aug.) 1932

*Roentgenologic Manifestations of Giant-Cell Tumor. B. R. Kirklin, Rochester, Minn., and C. Moore, Washington, D. C.—p. 145.
*Treatment of Giant-Cell Bone Tumors by Roentgen Irradiation. G. E. Pfahler and L. D. Parry, Philadelphia.—p. 151.
*Giant-Cell Bone Tumor: Consideration of Morphology of This Neoplasm, Response to Surgical and Radiation Therapy, and Report in Detail of Two Apparently Malignant Cases. C. B. Peirce, Ann Arbor, Mich.—p. 167.
Osteoporosis Circumscripta of Skull as Form of Osteitis Deformans. H. H. Kasabach and C. G. Dyke, New York.—p. 192.
Advantages of Roentgenoscopic Control in Roentgenography of Stomach. G. W. Grier, Pittsburgh.—p. 204.
*Evaluation of Compression Technic in Roentgen Demonstration of Duodenal Lesions. M. J. Geyman, Santa Barbara, Calif.—p. 211.
Experiences in Interstitial Irradiation of Carcinoma of Breast. O. N. Meland, Los Angeles.—p. 223.
Treatment of Carcinoma of Esophagus with Radon Implants: Description of Improved Implanter. H. I. Teperson, Brooklyn.—p. 229.
Change in Quality of Roentgen Rays on Passing Through Tissue. Edith H. Quimby and R. F. McNattin, New York.—p. 236.
Concerning Visibility of Roentgen Rays. R. B. Taft, Charleston, S. C.—p. 245.

Roentgenologic Manifestations of Giant-Cell Tumor.—In a series of eighty-six proved cases of giant-cell tumor, Kirklin and Moore encountered two roentgenologic types of the growth with approximately equal frequency. The first variety has been accurately described by many observers. It is a central tumor, situated most often in the end of a long bone, and it exhibits trabeculae and expands the cortex but does not break through it. Other tumors of bone which may be confounded with this type of giant-cell tumor are enchondromas and cysts of bone. In the second type of giant-cell tumor, as the authors have observed it, trabeculation is conspicuously absent. The roentgenograms give evidence of homogeneous lysis of the affected area; the cortex is not only expanded but is dissolved wholly or in part, and the tumor projects into the soft tissues. In many cases, the irregularly destroyed cortex has the appearance of a thin layer of melting ice. This variety of giant-cell tumor might be mistaken for primary sarcoma or a massive metastatic growth. Giant-cell tumor is not necessarily confined to the end of a long bone; exceptionally it may occur elsewhere in the shaft. Besides the long bones, the bones of the face, the vertebrae, the ribs and the tarsal bones are subject to the disease. In the authors' series, outstanding differ-

ences from other series reported were not observed in respect to age and sex of the patients or duration of the disease.

Treatment of Giant-Cell Bone Tumors. — Pfahler and Parry review twenty-six cases of giant-cell bone tumor in which the patients were referred for treatment between 1906 and 1931, covering a period of twenty-five years. The first case is probably the earliest case on record, and was originally considered osteosarcoma. All patients showed a definite and satisfactory response, more satisfactory in the young than in the old. Two patients died from intercurrent diseases. One had an amputation because of an osteomyelitis following incision, and in another a deformity of the jaw developed following similar procedures. The authors favor fractional doses with high voltage roentgen rays, but not carried to the point of damage to normal tissues. No damage to the epiphyses was observed. The authors believe that irradiation is definitely superior to surgery in the treatment of giant-cell tumors of bone. They believe that crushing the bone or curetting it is no advantage, but is rather a disadvantage.

Giant-Cell Bone Tumor.—Peirce analyzes nineteen cases of giant-cell tumor, fourteen confirmed by histopathologic study. In two of ten cases in which the patients were considered clinically cured the tumor had presented malignant features. No evidence was found to refute in general the customary belief that giant-cell bone tumor is essentially benign, suggestively neoplastic rather than inflammatory. Although in the presence of evidence of alleged preincident trauma and of possible intra-osseous hemorrhage, the consideration of an etiology in reparative or reactive granulation tissue must be weighed heavily against the neoplastic idea. In this regard Robin's original delineation is interesting as proposing an undue proliferation of an ordinarily normal, although sparse, constituent bone medulla cell. It is a disease of the metaphysis; the epiphysis as such is not involved. Whenever the neoplasm occurs after the epiphyseal disk has been obliterated by ossification, the tumor may invade to the under surface of the articulating cartilage. The various types of giant-cell tumor are not consistently differentiated by roentgenographic methods. The conception of treatment with intent of growth restraint is highly important. Roentgen irradiation in repeated relatively moderate doses offers the most for the patient, except when for cosmetic or functional reasons better results could be obtained with the addition of surgical intervention. Surgical intervention should not follow roentgen therapy short of from six weeks to two months. If surgery is contemplated, thorough curettage and equally thorough chemical cauterization of the cavity should be executed, followed immediately by a consistent roentgen therapy program. Surgery without cautery or immediate roentgen therapy has not offered so satisfactory a result in most cases. The author believes that in two of the cases malignant degeneration of part of a giant-cell bone tumor, or concurrent origin of a malignant neoplasm was shown—one case without peripheral metastases, one with pulmonary metastases. In the latter, the lung involvement might have been the result of giant-cell emboli from the original gross tumor. With this in view, the less the neoplasm is disturbed by trauma, accidental or induced, the less likely will there ensue a proliferative response of uncontrolled character.

Compression Technic in Roentgen Demonstration of Duodenal Lesions.—According to Geyman, compression technic as a means of obtaining roentgenographic studies of mucosa in relief is a valuable supplement to roentgen study of the duodenal cap. It increases the percentage of niche visualization. Evidence of the niche, when present, is shown with a high degree of detail. Considerable information as to the response of an ulcer to treatment may be obtained when a niche has been visualized. In a certain small percentage of cases, lesions of the duodenal cap may be demonstrated roentgenographically by the use of this technic, which would not be shown by either roentgenoscopic or other roentgenologic methods. In some types of duodenal ulcer, compression adds no information to that obtained by studies of the barium-filled cap. Accuracy of technic and interpretation is acquired only after considerable experience with the method. In the author's study, compression obtained by the Chaoul compressor was found to be the most satisfactory.

American Journal of Surgery, New York

17: 345-514 (Sept.) 1932

Volvulus of Large and Small Intestine: Report of Case of Volvulus of Cecum, Ascending Colon and Ileum. J. W. Keefe, Providence, R. I. —p. 345.
Inguinal and Femoral Hernia. H. L. Foss and N. F. Hicken, Danville, Pa.—p. 349.
Lymphosarcoma of Jejunum. M. L. Weinstein, Chicago.—p. 355.
Essential Surgery in Chronic Ulcerative Colitis. C. Rosser, Dallas, Texas.—p. 360.
Acute Intestinal Obstruction Caused by Impacted Gallstones: Case Reports. L. W. Angle, Kansas City, Kan.—p. 364.
Transverse Incision in One Hundred Consecutive Appendectomies. R. A. Cutting, New Orleans.—p. 369.
Chronic Cystic Arachnoiditis. W. M. Craig, Rochester, Minn.—p. 384.
Some Radiographic Aspects of Urinary Calculi. F. P. Twinem, New York.—p. 389.
*Renal Dystopia: Review of Three Hundred and Forty-Three Cases. H. L. Morris, W. L. Sherman and J. F. Brunton, Detroit.—p. 395.
Cavernous Hemangioma of Bladder: Case. E. G. Ballenger, O. F. Elder and H. P. McDonald, Atlanta, Ga.—p. 409.
Insulin in Obliterative Lesions of Blood Vessels. S. M. Beale, Jr., Sandwich, Mass.—p. 413.
Simplified Postoperative Routine for Diabetic Patient. J. T. Witherspoon, New Orleans.—p. 418.
Metastatic Pulmonary Carcinoma. R. C. Pendergrass, Americus, Ga.—p. 422.
*Studies on Effects of Subtotal Gastric Resection in Dog. G. B. Fauley, H. A. Strauss and A. C. Ivy, Chicago.—p. 427.
Local Surgery of Painful Backs: Report of Cases. M. H. Hobart, Evanston, Ill.—p. 434.
A Semiflexible Brace for Support of Longitudinal and Anterior Arches of Foot. W. I. Galland, New York.—p. 442.
The Lavoie Splint in Fractures of Humerus. G. S. Foster, Manchester, N. H.—p. 444.

Renal Dystopia.—Morris and his associates present a summary of 343 cases of renal dystopia that have been under their care in the past few years. From a study of these cases they conclude that body type does not influence renal dystopia. The predominating symptoms of the condition are those of urinary infection, stasis and backache, aptly termed nephralgia. From 15 to 20 per cent of all cases of backache are due to renal dystopia. The proper diagnosis and interpretation of roentgenograms are dependent on the method of procedure. In the great majority of cases of renal dystopia satisfactorily fitting belts, properly applied, plus routine treatment for urinary infection, have given complete relief of symptoms. The authors believe that nephropexy is seldom indicated in the treatment of renal dystopia.

Effects of Subtotal Gastric Resection in Dog.—Fauley and his associates describe experiments in which they noted that resection of at least 66 per cent of the stomach in ten out of twelve dogs resulted in varying degrees of compensatory hypertrophy of the gastric remnant. They believe that the hypertrophy was due to rapid eating of large quantities of food due to the polyphagia incident to inadequate digestion. The jejunum at the stoma was also hypertrophied. The emptying time of the stomach was permanently decreased in spite of the hypertrophy. The acidity of the gastric contents returned practically to normal in from three to five months. Jejunal ulcers developed in three of the twelve dogs.

American Review of Tuberculosis, New York

26: 209-321 (Sept.) 1932

Changing Status of the Sanatorium. J. Alexander, Ann Arbor, Mich. —p. 209.
Cavitation in Pulmonary Tuberculosis. F. M. Pottenger, Los Angeles. —p. 215.
Interfering Mechanical Factors in Healing of Pulmonary Tuberculosis. F. M. Pottenger, Los Angeles.—p. 229.
Treatment of Pollenosis in Tuberculosis Patients. M. R. Lichtenstein, Chicago.—p. 235.
*Oxygen Therapy in Pulmonary Tuberculosis. A. L. Barach and D. W. Richards, Jr., New York.—p. 241.
Effects of Oxygen Treatment over Long Periods of Time in Patients with Pulmonary Fibrosis. D. W. Richards, Jr., and A. L. Barach, New York.—p. 253.
Lymanhurst, a Public Health Outpost. W. P. Shepard, San Francisco. —p. 261.
Calcification of Experimental Intra-Abdominal Tuberculosis. T. D. Spies and R. Berryhill, Cleveland.—p. 275.
Observations on Red-Cell Sedimentation Test in Pulmonary Tuberculosis. J. Kaminsky and Doris L. Davidson, Rutland, Mass.—p. 282.
Leukocytic Changes in Children Vaccinated with Bacillus Calmette-Guérin. Vera B. Dolgopol and R. H. Stitt, New York.—p. 304.
A Phrenicectomy Necklace. N. Bethune, Montreal, Canada.—p. 319.

Oxygen Therapy in Pulmonary Tuberculosis.—In five patients who suffered from active pulmonary tuberculosis the

effects of oxygen treatment for periods of from one to four months are reported by Barach and Richards. In three, who had no disturbance of pulmonary function, there was no beneficial effect either on the clinical condition of the patient or on the tuberculous process itself. In the remaining two, pulmonary function was disturbed, one acutely and the other chronically. In each instance there was evidence of clinical improvement with relief of symptoms of anoxemia, but no retarding effect on the tuberculous lesion itself was apparent. In the patient who suffered from acute disturbances of pulmonary function in respect to the absorption of oxygen, the inhalation of an atmosphere containing 50 per cent oxygen was apparently responsible for prolonging his life over a period of from two to three months. The analysis of the blood gases in one case with arterial anoxemia showed an increase in the arterial oxygen as well as a marked elevation in the carbon-dioxide content of the arterial blood.

Annals of Internal Medicine, Ann Arbor, Mich.

6: 167-306 (Aug.) 1932

*Relation of Lipoid Nephrosis to Nephritis. E. T. Bell, Minneapolis. —p. 167.
Occurrence of Cystinuria in Healthy Young Men and Women. H. B. Lewis, Ann Arbor, Mich.—p. 183.
Effects of Administration of Glucose and Insulin and Glycogen Content of Normal and Experimental Damaged Livers. T. L. Althausen, San Francisco.—p. 193.
Pituitary and Sugar Tolerance Curve. J. Eidelsberg, New York.—p. 201.
*Clinical Interpretation of Jaundice Based on Physiologic Principles. H. W. Held and M. Kramer, New York.—p. 207.
Niemann-Pick's Disease (Essential Lipoid Histiocytosis). R. A. Knox and G. W. Ramsey, Washington, Pa.—p. 218.
Four Physiologic Defenses of Upper Part of Respiratory Tract: Ciliary Action, Exchange of Mucin, Regeneration and Adaptability. A. Hilding, Rochester, Minn.—p. 227.
Paranasal Sinusitis: Problem in General Medical Practice. A. D. Dunn and F. L. Dunn, Omaha.—p. 235.
Local and Constitutional Pathology of Bronchial Asthma. I. G. Macdonald, Ann Arbor, Mich.—p. 253.
Chronic Appendicitis. H. C. Saltzstein, Detroit.—p. 278.
Clinical Teaching, with Especial Reference to Bedside Study of Disease. L. J. Moorman, Oklahoma City.—p. 289.

Relation of Lipoid Nephrosis to Nephritis.—According to Bell, two forms of chronic glomerulonephritis are recognized: an azotemic type characterized by nitrogen retention, and an hydropic or nephrotic type characterized by marked edema and albuminuria. There are numerous transitions between these groups clinically. In the nephrotic type the kidneys are usually large and fatty, while in the azotemic type they are commonly contracted. The hydropic type, now called lipoid nephrosis, is often subdivided into pure lipoid nephrosis and a mixed type (nephritis with a nephrotic component). The pure differs from the mixed type in the absence of hematuria, hypertension, and impaired kidney function. When thorough and repeated studies are made, one rarely sees a case that corresponds to the rigid definition of pure nephrosis. A pure nephrosis may progress into the mixed type. Edema is a general feature of the nephritis. There is no basis for the belief that every nephritis with edema has a nephrotic component. If nephrosis is a distinct entity, nearly all cases of nephrosis have a nephritic component. The theory is proposed that the primary disturbance in both nephrosis and nephritis is an injury of the glomerular capillaries by some toxic substance. If little or no reaction occurs in the capillaries, the clinical picture of pure nephrosis develops; a moderate reaction produces some of the symptoms assigned to nephritis, viz., hematuria, hypertension, impaired kidney function; a marked reaction gives the clinical picture of nephritis. The clinical picture depends in large measure on the character of the injury in the glomerular capillaries. When they are open and allow albumin to escape in large quantities, nephrosis develops. When they are narrowed or occluded, there is not much loss of albumin, but hypertension and nitrogen ensue. Lipoid nephrosis is not a distinct entity but a form of glomerulonephritis.

Clinical Interpretation of Jaundice.—Held and Kramer state that jaundice as a leading objective symptom, when due to over production of bilirubin, exists free of any complaints pointing toward liver dysfunction. Any associated symptoms or signs reflect the cause of the hemolysis and its effects. When jaundice follows disturbed function of the hepatic epithelial cell or obstruction of biliary ducts, signs point toward the liver as the seat of damage. It is suggested that the group of "hemolytic" or "superfunction" icterus may be divided clinically, dependent on whether the abnormal quantity of bilirubin is the product of members of the reticulo-endothelial system normally engaged in this production (liver, spleen, bone marrow) or abnormally so functioning (endothelium of skin, peritoneum, lung, and so on). The bilirubin-excretory power of the liver cell may be utilized as an excellent test of liver function. Prolonged retention of injected bilirubin may be the only demonstrable evidence of a cellular dysfunction.

Annals of Surgery, Philadelphia

96: 321-480 (Sept.) 1932

*Traumatic Rupture of Intestines Caused by Automobile Accidents. H. H. Cooke, Lowville, N. Y.—p. 321.
Study of Mesenteric Cysts: Report of Two Recent Cases. J. O. Warfield, Jr., Washington, D. C.—p. 329.
Mesenteric and Omental Cysts. E. W. Peterson, New York.—p. 340.
Sodium Ricinoleate: Its Possible Value in Prevention and Treatment of Peritonitis. S. F. Seeley, Manila, P. I.—p. 350.
Internal Hernia Following Posterior Gastro-Enterostomy. E. P. Buchanan, Pittsburgh.—p. 359.
Posterior Pituitary Extract in Prevention of Postoperative Intestinal Distention: Preliminary Report. P. C. Potter and R. S. Mueller, New York.—p. 364.
*Roentgen-Ray Diagnosis of Acute Intestinal Obstruction Without Use of Contrast Mediums. L. Ginzburg, New York.—p. 368.
Carcinoma of Hepatic Duct. V. C. David, Chicago.—p. 381.
Prediction of Hemorrhage in Obstructive Jaundice by Sedimentation Rate. H. M. Clute and J. R. Veal, Boston.—p. 385.
Relation of Blood Fibrin to Hemorrhagic Diathesis of Obstructive Jaundice. R. R. Linton, Boston.—p. 394.
Surgical Treatment of Acute Cholecystitis. M. M. Zinninger, Cincinnati.—p. 406.
Intramural Calcification of Gallbladder. J. E. Davis and R. H. Bookmyer, Detroit.—p. 413.
Acute Pancreatic Necrosis and Its Sequelae: Critical Study of Thirty Cases. G. de Takáts and W. D. Mackenzie, Chicago.—p. 418.
Chronic Interlobular Pancreatitis. J. W. Hinton, New York.—p. 441.
*Postoperative Shock Following Splenectomy for Chronic Thrombocytopenic Purpura. R. Lewisohn, New York.—p. 447.
Etiology of Inflammatory and Degenerative Diseases of Appendix. B. Steinberg, Toledo, Ohio.—p. 451.
Myxoglobulosis (von Hanseman) of Appendix. V. G. Hentz, New York.—p. 456.

Rupture of Intestine Caused by Automobile Accidents.—Cooke presents twelve cases of traumatic rupture of the intestine found in 210 victims of automobile accidents who came to necropsy at the Department of Pathology, University of Minnesota, between Dec. 1, 1919, and Dec. 1, 1929. The site of the rupture was as follows: duodenum, three cases; jejunum, six cases; ileum, two cases; ascending colon, one case. In three cases the rupture of the intestine was associated with rupture in the stomach. In three cases the rupture was transverse and in one case nearly transverse, while in eight cases the size of the rupture varied from 5 to 15 mm. in diameter. The liver, spleen, kidneys or pancreas were injured in five cases. In seven cases there were no abrasions of the skin or any external evidences of injury to the abdomen. Death was the result of peritonitis in five cases, and of peritonitis and bronchopneumonia in one case. Exploratory laparotomy was performed on only one individual.

Roentgen Diagnosis of Acute Intestinal Obstruction.—According to Ginzburg, the plain roentgenogram of the abdomen without the use of contrast mediums is a distinct aid to the diagnosis of acute mechanical intestinal obstruction. It may be a decisive factor favoring operation in cases clinically doubtful. It permits differentiation between obstructions of the large and small intestine. The cardinal signs of obstruction of the small intestine are: (1) visualization of dilated loops of small intestine; (2) the presence of fluid levels in the small intestine; (3) failure to visualize gas in the colon. In the immediate postoperative phase caution must be used in differentiating mechanical obstruction from paralytic ileus or peritonitis, as all these may give the same roentgen appearance. Fluid levels and dilated loops of small bowel are probably not due to mechanical obstruction if there is coincident presence of gas in the colon. To reduce the chances of error it is advisable to take plates in the recumbent and erect positions. The diagnosis of colonic obstruction is easily made owing to

the marked distention of the colon proximal to the site of obstruction, and the presence of fluid levels with high vertical gas columns in it. Distended small intestine is not as a rule visualized in colonic obstruction. Localization of the obstruction in the colon is possible in a rough fashion. If necessary, a barium enema may be used to confirm exact localization. Sigmoid volvulus can usually be diagnosed as such from the roentgen appearance.

Postsplenectomy Shock. — Lewisohn states that chronic thrombocytopenic purpura is at present the most frequent indication for splenectomy. In the author's hospital more splenectomies were performed for this disease between 1926 and 1930 inclusive than for all other splenic diseases combined. As a rule, postoperative and late results of splenectomy in this group of cases are excellent. For some unknown reason sudden postoperative shock seems to follow splenectomy for chronic thrombocytopenic purpura in a large percentage of cases. This observation is of practical importance, as shock and hemorrhage are apt to give practically identical clinical pictures. Blood transfusion is the best method to combat postoperative shock following splenectomy. A properly tested donor ought to be present in the hospital at the time of operation for use in an emergency. The donor should be kept in the hospital for at least twelve hours, as late shock may follow.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

13: 453-508 (Aug.) 1932

General Principles Involved in Use of Heat for Diseases of Circulatory System. H. C. Bazett, Philadelphia.—p. 453.
Reducing and Treating Cervical Dislocations. T. P. Brookes and F. H. Ewerhardt, St. Louis.—p. 463.
Physical Therapy in Treatment of Erysipelas and Kindred Skin Infections. H. D. Holman, Mason City, Iowa.—p. 469.
Radioactivity in the Human and Its Detection. A. O. Gettler, New York.—p. 473.
Dangers of Internal Radium Therapy. F. B. Flinn, New York.—p. 476.
Effect of Ultraviolet Light in Cutaneous Conditions. G. M. Lewis, New York.—p. 483.
Radiotherapy in Gynecology. M. E. Grier, Omaha.—p. 486.

California and Western Medicine, San Francisco

37: 73-144 (Aug.) 1932

The Obesities: Their Origins and Some of the Methods of Reducing Them. L. F. Barker, Baltimore.—p. 73.
Progress of Urologic Surgery. N. G. Hale, Sacramento.—p. 81.
Acute Surgical Abdomen: Report on Operations in San Francisco Emergency Hospital During Last Ten Years. E. Butler, San Francisco.—p. 82.
Optic Nerve Changes in Nontraumatic Neurologic Disorders: Report of Cases. W. F. Schaller, San Francisco.—p. 85.
Rabies: Its History in Nevada. E. Records, Reno, Nev.—p. 90.
Surgery of Kidney During Pregnancy: Report of Case. F. Farman and K. C. Gummess, Los Angles.—p. 94.
Semilunar Cartilages: Their Removal from Knee Joint. G. J. McChesney, San Francisco.—p. 98.
Twins: Study of Certain Mental Disorders: Preliminary Report. A. J. Rosanoff, Los Angeles.—p. 101.
Tuberculosis Among Oriental Children in San Francisco. L. B. Dickey, San Francisco.—p. 105.
Tuberculin Test: Its Value in Diagnosis of Childhood Tuberculosis, with Review of Recent Progress. E. Wolff and R. S. Stone, San Francisco.—p. 108.
Essays on History of Embryology. A. W. Meyer, San Francisco.—p. 111.
Hygiene a Hundred Years Ago, from an English Viewpoint. S. L. M. Rosenberg, Los Angeles.—p. 115.

Canadian Public Health Journal, Toronto

23: 353-402 (Aug.) 1932

Contributions of Engineer to Public Health Conservation. H. P. Eddy, Boston.—p. 353.
Municipal Expenditure for Sanitary Works. R. C. Harris, Toronto.—p. 362.
Refuse Collection in Urban Centers. H. S. Nicklin, Guelph, Ont.—p. 368.
Progressive Fight Against Typhoid Fever in Canada During Past Twenty Years, with Especial Reference to Controlling Factors. N. J. Howard, Toronto.—p. 376.
Planning Sewage Systems for Public Health Requirements. J. C. Keith, Windsor, Ont.—p. 385.

Delaware State Medical Journal, Wilmington

4: 141-162 (July) 1932

Study of Delaware Medical Practice Act. Prepared by Bureau of Legal Medicine and Legislation, American Medical Association.—p. 141.
Mumps Meningitis: Report of Case. S. Worden, Dover.—p. 152.

4: 163-194 (Aug.) 1932

Moses: The Health Officer. A. C. Jost, Dover.—p. 163.
Sanitation in Delaware: Eight Years in Retrospect. R. C. Beckett, Dover.—p. 169.
Rickets and Tetany. J. B. Derrickson, Frederica.—p. 175.
Rabies. R. D. Herdman, Dover.—p. 178.
Typhoid Fever Antitoxin. S. Worden, Dover.—p. 180.
Report on Tuberculosis and Hookworm. C. A. Sargent, Dover.—p. 181.
Pulmonary Tuberculosis in Childhood. L. D. Phillips, Marshallton.—p. 183.
The White House Conference. E. F. Smith, Georgetown.—p. 185.
Social Insurance. E. H. Oschsner, Chicago.—p. 188.

Florida Medical Association Journal, Jacksonville

19: 53-92 (Aug.) 1932

Amelioration of Labor Pains. R. G. Nelson, Tampa.—p. 59.
Chronic Infectious Arthritis: Etiology and Practical Methods of Treatment. J. E. Gammon, Jacksonville.—p. 63.
Chronic Arthritis. L. F. Carlton, Tampa.—p. 68.
Treatment of Medical Cases at Hope Haven. T. M. Palmer, Jacksonville.—p. 70.
Treatment of the Crippled Child at Hope Haven. F. L. Fort, Jacksonville.—p. 73.
Possible Advantage of Removal of Persons Suffering from Recurrent Rheumatism Endocarditis to Tropics. L. F. Bishop and L. F. Bishop, Jr., New York.—p. 75.

Illinois Medical Journal, Chicago

62: 197-288 (Sept.) 1932

*Toxemias of Pregnancy and Their End-Results from the Point of View of Internal Medicine. W. W. Herrick, New York.—p. 210.
The Laity in Medicine. T. P. Foley, Chicago.—p. 220.
Practice of Medicine Versus the Profession of Medicine. L. O. Frech, Decatur.—p. 222.
Intrinsic Carcinoma of Larynx, with Consideration of Some Methods of Operative Approach. R. Sonnenschein and S. J. Pearlman, Chicago.—p. 229.
Necessity for Accurate and Complete Certificates of Births and Deaths. G. Koehler, Springfield.—p. 234.
Complications of Cataract Surgery in India. L. Bothman, Chicago.—p. 243.
Immunization Against Scarlet Fever. R. P. Peairs, Normal.—p. 246.
Treatment of Prostatic Obstruction with Electric Resectoscope. H. L. Kretschmer, Chicago.—p. 249.
Bile Ducts and Jaundice with Relation to Operative Risk. B. Markowitz, Bloomington.—p. 254.
Crippled Children's Clinics Conducted by County Medical Society. P. H. Kreuscher, Chicago.—p. 258.
Presenting the Cancer Control Problem to the Public. E. G. C. Williams, Danville.—p. 261.
Is the Abnormal to Become Normal? Lena K. Sadler, Chicago.—p. 265.
Public Health Education. H. E. Kleinschmidt, New York.—p. 269.
Pathologic Solicitude. A. S. Hershfield, Chicago.—p. 274.
Calcium in Obstetrics and Gynecology. E. Podolsky, Brooklyn.—p. 278.
Roentgen-Ray Diagnosis of Chronic Appendicitis (Barium-Magnesium-Sulphate Method). H. Swanberg, Quincy.—p. 281.
Bronchial Asthma: Progress in Diagnosis and Treatment. L. Unger, Chicago.—p. 282.

Toxemias of Pregnancy. — According to Herrick, the toxemias of pregnancy may be separated into early and late types. The former are characterized chiefly by pernicious vomiting, rarely by acute atrophy of the liver. They are probably without serious after-effects. The late toxemias are marked by albuminuria, hypertension, nervous and mental changes, edema, bilirubinemia, anemia, epigastric pain and tenderness, and convulsions; these symptoms appear singly or in any combination. These may have serious after-effects. Those in which the kidney is primarily at fault form a definite group. These are examples of a primary defect in the secreting mechanism of the kidney and may fall under the headings: nephrosis, parenchymatous nephritis or glomerulonephritis. Clinically they are marked by a prolonged albuminuria of high degree with or without retention of nitrogen in the circulating blood. Hypertension is a secondary feature. Practically, these are examples of nephritis complicated by pregnancy. The larger group of late toxemias includes the eclampsias, the preeclampsias and milder types which have been variously classified. In these, the patients do not have nitrogen retention, and albuminuria is not a prolonged feature but occurs late and suddenly. Pathologically and clinically in follow-up studies there is much to suggest that in their immediate and remote effects these are examples of vascular disease primarily and have much in common with the ordinary hypertensive cardiovascular disease or hyperpiesia. The loose use of the term nephritis in association with the late toxemias of pregnancy should no longer be countenanced. Recognition that the problem of these toxemias is bound up with that of cardiovascular disease with hypertension seems a helpful step in the search for their cause.

Indiana State Medical Assn. Journal, Fort Wayne

25: 335-370 (Aug. 15) 1932

Drug Therapy: Its Importance: The Indispensable Drugs. R. A. Solomon, Indianapolis.—p. 335.
Focal Infection. A. C. Nickel, Bluffton.—p. 339.
Interior of Uterus Observed by Hysteroscopic Examinations with Findings in Study of Twenty-Five Cases. W. H. Kennedy and J. E. Pilcher, Indianapolis.—p. 341.
Causes of "Reaction with Chill" Following Intravenous Administration of Normal Salt Solution. W. D. Little, Indianapolis.—p. 344.
Clinical Psychology. C. M. Louttit, Indianapolis.—p. 345.

Journal of Clinical Investigation, New York

11: 871-1064 (Sept.) 1932

Studies on Effect of Action of Digitalis on Output of Blood from Heart: I. Effect on Output of Dog's Heart in Heart-Lung Preparations. A. E. Cohn and J. M. Steele, New York.—p. 871.
Id.: II. Effect on Output of Hearts of Dogs Subject to Artificial Auricular Fibrillation. H. J. Stewart and A. E. Cohn, New York.—p. 897.
*Id.: III. Part I. Effect on Output in Normal Human Hearts: Part II. Effect on Output of Hearts in Heart Failure with Congestion, in Human Beings. H. J. Stewart and A. E. Cohn, New York.—p. 917.
Lactic Acid of Blood in Hepatic Disease. A. M. Snell and Grace M. Roth, Rochester, Minn.—p. 957.
*Dietary Protein in Hemorrhagic Bright's Disease: I. Effects on Course of Disease, with Especial Reference to Hematuria and Renal Function. E. H. Keutmann and W. S. McCann, Rochester, N. Y.—p. 973.
Studies of Diabetes Mellitus: Evidence that the Disability is Concerned Solely with Metabolism of Glucose: Mode of Action of Insulin. L. H. Newburgh and Dorothy S. Waller, Ann Arbor, Mich.—p. 995.
Comparative Study of Excretion of Water and Solids by Normal and Abnormal Kidneys. F. H. Lashmet and L. H. Newburgh, Ann Arbor, Mich.—p. 1003.
Studies on Physiology of Parathyroid Glands: V. Action of Parathyroid Extract on Renal Threshold for Phosphorus. R. Ellsworth, Baltimore.—p. 1011.
*Vasodilatation in Lower Extremities in Response to Immersing Forearms in Warm Water. J. H. Gibbon, Jr., and E. M. Landis, Philadelphia.—p. 1019.
Effect of Nasopharyngeal Operations on Renal Function. I. H. Page and A. Alving, New York.—p. 1037.
Studies of Urea Excretion: VII. Effects of Posture and Exercise on Urea Excretion. D. D. van Slyke, A. Alving and W. C. Rose, New York.—p. 1053.

Action of Digitalis: III.—According to Stewart and Cohn, a consequence of the action of digitalis is to decrease the volume output of blood per minute from the heart in normal human beings and to decrease its size. The volume output of blood per minute from the heart which is in failure is diminished and its size is larger than when it is in a state of compensation. Following the administration of theocalcin in patients during heart failure, cardiac output increases and cardiac size and venous pressure diminish. Giving digitalis increases the volume output of blood per minute from failing hearts and decreases their size. The authors believe that digitalis has similar, perhaps identical, actions both in normal and in diseased hearts; it decreases cardiac size and increases the extent of ventricular contraction. The consequence of these actions is that the volume of the cardiac output which results differs, depending on an initial difference in size of the ventricular cavities, in the two situations. In the one, the normal heart, it becomes too small, in the other, the diseased heart, it develops a suitable size.

Dietary Protein in Hemorrhagic Bright's Disease.—Four patients with chronic hemorrhagic Bright's disease were observed by Keutmann and McCann during different levels of protein intake, ranging from about 40 to 200 Gm. a day. No deleterious effects on the course of the disease were observed during periods of liberal protein intake. 1. Hematuria, as a measure of intensity of glomerular injury, was not increased. 2. Functional capacity, as measured by blood urea clearance, continued to increase. 3. Slight increases in proteinuria which occurred in two cases during the higher protein diets are believed to be without deleterious significance. 4. Slight increases in azotemia occurred, which were accentuated by the restriction of water intake necessary in making sediment counts. 5. Serum proteins fluctuated independently of the level of protein intake and of nitrogen balance. 6. Blood pressure was not increased by the more liberal protein allowance. 7. General clinical improvement occurred in all cases. Weight increased (not due to edema); anemia improved, and patients returned to their normal state of strength and vitality.

Vasodilatation in Lower Extremities.—Gibbon and Landis state that in normal subjects immersing the forearms in warm water (from 43 to 45 C.) produces vasodilatation in the lower extremities. In ten observations on the spontaneously cool extremities of six normal subjects the rise in digital skin temperature began within fifteen minutes after immersing the forearms in water. The skin temperature in all but one of these observations exceeded 32 C. by the twenty-ninth minute. The immersion of one forearm or one leg in warm water produced vasodilatation in the other extremities. This type of vasodilatation apparently depends on the return of warmed blood from the immersed extremity. The rise in rectal temperature produced by immersing two limbs in warm water ranged in three experiments from 0.1 C. to 0.6 C. Three cases illustrating vasodilator responses in certain types of vascular disorders of the extremities are reported. With this method of producing vasodilatation, if the digital temperature rises above 32 C., organic occlusion of the vessels supplying the extremity may be excluded.

Journal of Immunology, Baltimore

23: 101-186 (Aug.) 1932

Studies in Anaphylaxis in Rabbit: I. Study of Factors Concerned in Establishment of Maximal Hypersensitiveness in Rabbits to Egg White and Horse Serum. Ella F. Grove.—p. 101.
Id.: II. Effect of Histamine, Barium Chloride and Epinephrine on Unstriped Muscle of Guinea-Pig and Rabbit. Ella F. Grove.—p. 125.
Id.: III. Sensitization of Rabbits with Fowl Corpuscles. Ella F. Grove.—p. 139.
Id.: IV. Simonds Explanation of Different Pathology of Acute Anaphylactic Shock in Different Animal Species: V. Rôle of Unstriped Muscle in Acute Anaphylaxis in Rabbit. Ella F. Grove.—p. 147.
Specific Agglutination and Precipitation: II. Velocity of Reactions. H. Eagle, Baltimore.—p. 153.

Journal of Pediatrics, St. Louis

1: 145-268 (Aug.) 1932

*Psychologic Aspects of Nutrition in Childhood. J. Brennemann, Chicago.—p. 145.
*Stovarsol in Peroral Treatment of Congenital Syphilis. A. F. Abt and A. S. Traisman, Chicago.—p. 172.
*"Pernicious" Blood Pictures in Infancy. T. B. Cooley and Pearl Lee, Detroit.—p. 184.
*Simple, Inexpensive Stock Formula for Young Infants. L. Sauer, Evanston, Ill.—p. 194.
Nirvanol Treatment of Acute Chorea in Children. R. H. Dennett and S. Wetchler, New York.—p. 203.
Nirvanol Treatment of Chorea. G. F. Weinfeld, Ravinia, Ill., and R. Cohen, Chicago.—p. 210.
The Addis Sediment Count in Children: Means of Determining Presence of Kidney Lesion. W. B. Rew and A. M. Butler, Boston.—p. 216.
*Epidural Abscess Complicated by Staphylococcic Meningitis: Report of Case with Complete Recovery Following Operation. E. Rosamond, Memphis, Tenn.—p. 230.
Congenital Cystic Disease of Lung: Report of Case. R. L. Nelson, Boston.—p. 233.
Exophthalmic Goiter in Identical Twin Girls. F. C. Neff, Kansas City, Mo.—p. 239.
Antiques of Pediatric Interest. T. G. H. Drake, Toronto, Canada.—p. 244.

Psychologic Aspects of Nutrition.—According to Brennemann, there is a little practical point in infant psychology that often leads to misinterpretation. The baby at the breast commonly falls off to sleep after the conventional, ritualistic twenty minutes that is a part of nursing tradition, commonly much earlier if left to his own better judgment. Long before that time he has obtained all that the breast will yield, except for the small amount that is being made at the time and that mothers so often erroneously adduce as evidence that the breast has not been emptied. With a full stomach and a most acceptable natural pacifier, he gradually becomes fatigued and tranquilly goes to sleep. In nursing on the bottle, on the other hand, there is no change in quantity delivered, or in effort, until the bottle is suddenly empty. Even though his little stomach is full enough he will naturally assert one of the three fundamental Watsonian instincts, rage, at the sudden interruption. Unfortunately this short, sudden outburst of crying is often interpreted as due to hunger, and the food is increased beyond the necessary, sometimes beyond the desirable or safe, amount. This constitutes the obverse of the baby that does not cry when habitually underfed on the breast, whose not crying is misinterpreted as satiety. There are other practical psychologic aspects during the first year. In changing from a bottle to a wetnurse, much precious, even fateful, time may be lost in trying to get a marantic infant beyond the workable age to take the breast, when drawing off the milk and giving it in the accustomed manner would make no break

in the desirable continuity of feeding. Even more frequent and more important, in this day when wetnurses are rarely employed except in hospitals and under any circumstances have their milk drawn as a rule, is the bearing of all this on the infant that enters the hospital in a serious state of nutrition or for some serious illness. It is important again to have no unavoidable delay in the carrying out of a feeding schedule. If the baby is on the breast alone, and especially if he is in the second half year of life and the mother still has an abundance of milk, or even a fair amount, either he ought not to be in the hospital or, if that is insurmountable, provision should be made for the mother to keep on nursing him at least part of the time until the danger of underfeeding in a crisis is over with. If the baby is on a bottle, he must be kept on a bottle no matter how old he may be. If he drinks only from a cup, much time may be lost by trying to make him take a bottle just because he is a baby. If, again, the older infant will drink neither from a bottle nor from a cup, a not infrequent occurrence if the mother has had or has thought she had an adequate supply of milk up to that time, he must be fed with a spoon or, better still, with a medicine dropper tipped with a short length of catheter, or by gavage until he can be inducted into the more usual methods.

Acetarsone in Oral Treatment of Congenital Syphilis.—Abt and Traisman report observations from which they conclude that acetarsone in the treatment of congenital syphilis is an effective and rapidly acting antisyphilitic remedy. The medication is easily administered and easily controlled. Their results warrant the belief that the oral administration of acetarsone is the method of choice in the treatment of congenital syphilis. The cooperation of the patients is greatly increased by the use of this method. Previously, when congenitally syphilitic children were treated by intramuscular therapy, great difficulty was experienced in having the patients return regularly for full courses of medication. The authors strongly emphasize that patients undergoing treatment with acetarsone should be kept under close and careful observation. Parents should be warned that at the first sign of fever, vomiting, diarrhea, or appearance of rash, the medication should be immediately discontinued. In this manner, any serious untoward effects can be eliminated. Under this form of therapy the general physical condition of infants and children improves rapidly, and the gain in weight is noteworthy.

"Pernicious" Blood Pictures in Infancy.—Cooley and Lee present eight cases of anemia in infants in which the blood picture resembled that of pernicious anemia in the finding of macrocytes, megaloblasts and (in all but one) a high color index. Three showed leukopenia. The histories indicated iron deficiency as the cause of the anemia. Improvement after transfusion was rapid, and abnormal cells disappeared promptly. The gain in hemoglobin was closely proportional to that contained in the transfused blood. There was no relapse when suitable diet was given. The authors suggest that blood pictures of this kind are indicative of some deficiency which prevents the production of enough mature cells, and causes an output of unripe forms.

Simple, Inexpensive Formula for Young Infants.—Sauer records observations that were made during the past eighteen months and that embrace 100 artificially fed private patients and 50 young institutional infants. The only formula used was one so closely simulating breast milk that the results compare favorably with those observed in the nursling. The sterilized stock formula (basic formula: evaporated milk, 6 ounces; water, 12 ounces; lactose, 1 ounce) is quite like breast milk in composition, taste and digestibility. It has a value of approximately 21 calories per ounce. It is inexpensive. It is practical for the individual infant or for groups of young infants (maternity wards, day nurseries and foundling homes). When the twenty-four hour amount is kept between 40 and 50 calories a pound, the rate of gain is quite like that of nursing infants of the same age and weight. The author's observations indicate that the normal infant can grow on artificial food without the customary strengthening of formulas. The substitute for breast milk he recommends requires merely an increase in the daily quantity when the weight increase lags. The stools of infants fed exclusively on this formula from birth often resemble in appearance, color, consistency and odor those of breast-fed infants. Smears of such stools, stained by Gram's method, show a preponderance of gram-positive bacilli which resemble those found in the breast-fed infant's stool (B. bifidus or B. acidophilus). On many occasions the microscopic appearance of the stool was indistinguishable from breast stools. In no instance did the food cause enteritis, nor did any infant fail to gain within a week after the formula was instituted. In recent months the author has to a great measure substituted it for breast milk in prematurely born infants with an inadequate maternal supply.

Epidural Abscess Complicated by Staphylococcic Meningitis.—Rosamond reports a case of primary, hematogenous epidural abscess localized in the lumbar region. Cerebrospinal staphylococcic meningitis developed after the introduction of the spinal puncture needle through the infected area. Complete recovery followed laminectomy and drainage of the abscess cavity, plus an intradural drain and the administration of large quantities of fluid.

Maine Medical Journal, Portland

23: 155-172 (Aug.) 1932

Cardiac Surgery. E. C. Cutler, Boston.—p. 156.
Effect of Workmen's Compensation Act on Industrial Surgery in New England. S. A. Cobb, Sanford.—p. 161.
How Is Prevention Possible in Cancer? J. C. Bloodgood, Baltimore. —p. 165.

Medical Journal and Record, New York

136: 133-176 (Aug. 17) 1932

Comparative Study of Infant Foods. R. H. Dennett and J. D. Craig, New York.—p. 133.
Value of Ophthalmoscopic Signs in Preapoplectic Stage. M. Cohen, New York.—p. 135.
Starvation Ligature and Lymphatic Block for Irremovable Carcinoma of Uterus, with Points of Especial Interest: Case. W. S. Bainbridge, New York.—p. 137.
Phases of Pneumonia. G. M. Ball, New York.—p. 138.
Vaccine Treatment of Infections. J. G. W. Greeff, New York.—p. 141.
Feeblemindedness. C. G. McGaffin, Randall's Island, N. Y.—p. 142.
Positive Subjective and Objective Symptoms of Acute Abdominal Condition with Negative Findings: Report of Case. S. J. Turel, New York.—p. 144.
Some Spinal Cord Syndromes Often Erroneously Diagnosed. T. A. Williams, Washington, D. C.—p. 145.

New England Journal of Medicine, Boston

207: 335-384 (Aug. 25) 1932

Chronic Appendicitis. R. P. Watkins, Worcester, Mass.—p. 335.
Medical Aspects of Appendicitis. G. L. Steele, Springfield. Mass.—p. 341.
Factors Reducing Mortality in Acute Appendicitis. H. M. Clute, Boston. —p. 347.
Mortality of Acute Appendicitis. G. P. Muller, Philadelphia.—p. 355.
New Procedure for Obstetric Analgesia. H. H. Rosenfield and R. B. Davidoff, Boston.—p. 366.

207: 385-434 (Sept. 1) 1932

Gastric Ulcer Associated with Diaphragmatic Hernia. P. E. Truesdale, Fall River, Mass.—p. 385.
Acute Perforation of Peptic Ulcer: Study of One Hundred and Six Cases. A. Corvese, Providence, R. I.—p. 390.
Emergency Treatment of Extremity Fractures. R. H. Kennedy, New York.—p. 393.
Intussusception in Adults. G. A. Moore, Brockton, Mass.—p. 395.
Nonoperative Treatment of Carbuncles. W. A. White, Jr., and E. A. Cooney, Boston.—p. 398.
Trichomonas Vaginalis Vaginitis. J. V. Meigs, Boston.—p. 403.
Appendicitis. J. B. Woodman, Franklin, N. H.—p. 406.
Inversion of Uterus: Report of Unusual Case. E. M. Fitch, Claremont, N. H.—p. 413.

207: 435-482 (Sept. 8) 1932

*Primary Carcinoma of Lung: Diagnosis and Treatment with Roentgen Ray. P. F. Butler and M. Ritvo, Boston.—p. 435.
*Roentgenologic Diagnosis of Gallbladder Disease. G. Levene, Norwood, Mass.—p. 443.
Treatment of Growths by Electrosurgery. G. A. Wyeth, New York.—p. 450.
Colon Irrigation in Treatment of Mental Disease. H. K. Marshall and C. E. Thompson, East Gardner, Mass.—p. 454.
Physical Therapy: An Aid to Routine Medical and Surgical Practice: Motion Picture Demonstration. F. H. Krusen, Philadelphia.—p. 458.
Recurring Intestinal Obstruction by Gallstone. P. H. Cook and R. P. Watkins, Worcester, Mass.—p. 462.
Amniotic Fluid Concentrate: Postoperative Use to Stimulate Peritoneal Defense and Repair: Report of Case of Multiple Laparotomies. A. R. Kimpton, Boston.—p. 465.

Primary Carcinoma of Lung.—According to Butler and Ritvo, primary carcinoma of the lung is a relatively common condition and not the rare unusual lesion previously supposed. It is a disease of the cancer age, is more common in

men, and involves the right lung more frequently than the left. These tumors are bronchiogenic in origin, originating from the epithelium lining the bronchi. The common clinical symptoms are cough, dyspnea, pain in the chest and hoarseness. The physical signs are valuable and depend on the size and location of the tumor. If the mass is small or deep in the lung, there may be complete absence of signs and symptoms. Atelectatic changes due to bronchial occlusion and the formation of fluid in the pleural space are common. The roentgen examination is of extreme importance, both in arriving at a diagnosis and in studying the progress of the disease. The roentgen signs are divided into primary and secondary manifestations. The primary roentgen sign is the demonstration of the tumor and it is possible to show the size, shape and location of the mass. The secondary manifestations comprise pleural effusion, atelectatic changes, emphysema, pneumonic infiltration, bronchiectasis, displacement of the mediastinum, metastases and erosion of the ribs. Bronchoscopy, the injection of iodized oil, and laboratory investigations of the sputum and the fluid obtained by tapping the chest are of great value in arriving at a diagnosis. In the treatment of this disease, surgery may offer hope of cure if the diagnosis is made early. Roentgen and radium therapy prolong life and give relief of distressing symptoms.

Roentgenologic Diagnosis of Gallbladder Disease.—Levene points out that complete cholecystographic examination includes observations relative to visibility, mottling, direct and reflex tenderness, mobility, contraction, elasticity and emptying. In acute cholecystitis there is no visualization associated with subcostal and reflex tenderness. Chronic cholecystitis presents a variable shadow, usually fair or poor; local and reflex tenderness; limited mobility; diminished elasticity; weak or absent contractions, and delayed emptying. In the presence of stones, without extensive disease of the vesicle, visibility is usually good; there is direct and reflex tenderness, free mobility and active contractions. "Stripping" usually presents a local bulge corresponding to the site of the stones. Emptying may be normal or delayed, depending on the patency of the cystic duct during contraction. Good visibility, tenderness, active contractions with delayed emptying, even in the absence of mottling, point to stone. Adhesions are demonstrated fluoroscopically by diminished or absent mobility, depending on whether the gallbladder is adherent to a movable or comparatively fixed viscus. Abnormal peritoneal attachments produce characteristic deformities of the gallbladder shadow, and, unless associated with other changes, there is no roentgenologic evidence of cholecystopathy. Reflex disturbance is shown as a sudden increase in the size of the vesicle during contraction, together with nausea or vomiting. Variations in the anatomic location and relations of the gallbladder must be considered in the evaluation of roentgenologic observations. The strawberry gallbladder is recognized by its good visibility, direct and reflex tenderness, active contractions and rapid emptying.

Pennsylvania Medical Journal, Harrisburg

35: 751-830 (Aug.) 1932

Symposium on Brain Tumors: Roentgenologic Aids in Diagnosis of Brain Tumors. E. P. Pendergrass, Philadelphia.—p. 751.
Id.: Neurosurgical Considerations for Diagnosis and Localization of Brain Tumors. T. Fay, Philadelphia.—p. 752.
Id.: Clinical Aids in Diagnosis of Brain Tumors. N. W. Winkelman, Philadelphia.—p. 754.
Roentgen-Ray Treatment of Erysipelas. B. P. Widmann, Philadelphia.—p. 758.
Injuries of Bones and Soft Tissues of Face. R. H. Ivy, Philadelphia.—p. 761.
Cancer of Larynx: Diagnosis and Treatment. F. O. Lewis, Philadelphia.—p. 763.
Tuberculosis of Larynx: Diagnosis and Treatment. S. H. Ratner, Pittsburgh.—p. 769.
Neuro-Otologic Examination, as Aid in Management of Acute and Chronic Mastoiditis. L. Fisher, Philadelphia.—p. 771.

Psychoanalytic Quarterly, Albany, N. Y.

1: 191-373 (July) 1932

Concerning Sexuality of Woman. S. Freud.—p. 191.
The Acquisition of Fire. S. Freud.—p. 210.
Pleasure in Disguise, Need for Decoration and Sense of Beauty. E. J. Härnik, Berlin, Germany.—p. 216.
Some Clinical Data on Ideas of Reference. M. R. Kaufman, Waverley, Mass.—p. 265.

Public Health Reports, Washington, D. C.

47: 1771-1811 (Aug. 26) 1932

Note on Experimental Infection of Anopheles Punctipennis with Quartan Malaria. B. Mayne.—p. 1771.

Surgery, Gynecology and Obstetrics, Chicago

55: 265-408 (Sept.) 1932

*Etiology of Gastric and Duodenal Ulcer: Experimental Studies. W. B. Matthews and L. R. Dragstedt, Chicago.—p. 265.
Hysterectomy and Artificial Menopause. J. V. Sessums, Galveston, Texas, and D. P. Murphy, Philadelphia.—p. 286.
*Experimental Studies on Subarachnoid Anesthesia: I. Paralysis of Vital Medullary Centers. F. W. Cotui and S. Standard, New York.—p. 290.
*Mechanics of Reverse Flow of Blood in Varicose Veins as Proved by Blood Pressure Readings: Its Clinical Application to Injection Treatment. H. O. McPheeters, C. E. Merkert and R. A. Lundblad, Minneapolis.—p. 298.
Obstructive Pulmonary Emphysema and Collateral Respiration. C. M. van Allen, Peiping, China.—p. 303.
*Carcinoma of Gallbladder and Bile Ducts. E. S. Judd and H. K. Gray, Rochester, Minn.—p. 308.
Spinal Zone Anesthesia; Placed at Will and Dosage Individually Graded. M. Kirschner, Tuebingen, Germany.—p. 317.
Resection of Pituitary Adenomas. C. H. Frazier, Philadelphia.—p. 330.
Traumatic Separation of Symphysis Pubis During Spontaneous Labor: Clinical and Roentgen-Ray Study of Normal Symphysis Pubis During Pregnancy and the Puerperium. R. A. Reis, J. L. Baer, R. A. Arens and Ellen Stewart, Chicago.—p. 336.
Recent Developments in Treatment of Gastric Lesions. W. Walters, Rochester, Minn.—p. 355.
Bacterial Concretions in Kidney Pelvis: Report of Two Personal Cases. A. J. Scholl, Los Angeles.—p. 360.
Acute Head Injury: Study of One Thousand Cases. S. B. Wortis and F. Kennedy, New York.—p. 365.
Sunlight in Surgery. F. P. Corrigan and W. Boukalik, Cleveland.—p. 371
Hemangioma of Vertebrae. B. J. Alpers and H. K. Pancoast, Philadelphia.—p. 374.
Fractures of Wrist: Review of One Hundred and Seventy-Six Cases. R. K. Ghormley and R. J. Mroz, Rochester, Minn.—p. 377.

Etiology of Gastric and Duodenal Ulcer.—Matthews and Dragstedt report that the experimental reproduction in the lower animal of a counterpart of the Meckel's diverticulum ulcer of man, by the implantation of a small isolated pouch of gastric wall into the jejunum and ileum, yielded chronic progressive ulcers in 85 per cent of trials in the former and in 100 per cent in the latter. This is a striking example of the susceptibility of an organism's living tissues to the irritant action of its own pure, active gastric juice. A repetition of the experiment of gastrojejunostomy and surgical duodenal drainage, as in the Mann experiment, but with implantation of the duodenum 40 cm. below the anastomosis of the jejunum with the stomach, resulted in the development of only one ulcer in twenty-one experiments. This freedom of ulcer formation was due to the regurgitation of duodenal juices to the region of anastomosis, since the introduction of a valve to prevent such regurgitation led to the formation of chronic progressive jejunal ulcers in six cases. Preventing the regurgitation of alkaline duodenal juices into the stomach of normal dogs, by fixing a valve in the pylorus, raised both the free and the total acidity of the gastric content after a standard test meal, delayed the neutralization of 0.5 per cent hydrochloric acid placed in the stomach, delayed the healing of acute ulcers in the gastric mucosa produced by the injection of silver nitrate, and caused the appearance of spontaneous ulcers in transplants of intestinal mucosa sutured into defects in the stomach wall. In the application of these observations to the problem of spontaneous ulcer in man, the authors emphasize the fact that no evidence has been offered which contradicts the possible deterrent action of coarse food in the healing of acute lesions of the stomach or duodenum. Of these three factors operative in healthy persons, however, the chemical action of the gastric secretion seems to be the most important, both in the production of the acute lesion and in its subsequent chronicity.

Experimental Studies on Subarachnoid Anesthesia.—Cotui and Standard have demonstrated in experiments on dogs that procaine through direct action on the medulla produces respiratory and vasomotor paralysis when injected in sufficient concentration into the cisterna magna. When complete paralysis occurs, artificial respiration and the intravenous injection of ephedrine are effective as measures of resuscitation. In sodium amytal and in combination morphine-sodium amytal narcosis, there is a lowered resistance of the centers to the paralyzing effects of procaine.

Mechanics of Reverse Flow of Blood in Varicose Veins.—McPheeters and his associates state that in any well developed case of varicose veins the blood is slowed or stagnant. When a patient is walking, the flow is actually reversed and is outward from the femoral and downward through the varicosed saphenous system. Proof of this statement is apparent with (1) the Trendelenburg and Perthes tests, (2) iodized poppy-seed oil injection of varicose veins, (3) skiodan injection of varicose veins, and (4) blood pressure experiments. The theory of the reversed flow of blood in varicose veins and its mechanics should be applied in the treatment of every case. The actual technic employed in the individual case should vary with the case at hand. The entire condition of one or both legs should be treated completely at the first sitting to insure a better result. Theoretically there should be less danger of embolus formation with this technic. It is essential, also, that the saphenous vein be thrombosed up to the saphenofemoral ring to produce a lasting result. As far as their search of the literature has revealed, this is the first report of any work recording the blood pressure in the deep femoral in the human being.

Carcinoma of Gallbladder and Bile Ducts.—Judd and Gray present a pathologic and clinical study of 212 cases of a primary malignant growth of the gallbladder, and 100 cases of malignancy of the extrahepatic biliary ducts. This represents 1.4 per cent of all cases in which operation for lesions in the gallbladder or biliary tract were performed during the same period as that represented by the cases studied. Of cases of carcinoma of the gallbladder, 74 per cent occurred in women. Of cases of carcinoma of the bile ducts, 51 per cent occurred in men. The average age of their 312 patients was 57.1 years. The youngest patient observed was 23 years of age and the oldest, 78. Of the symptoms, the most frequent is jaundice associated with pain in the right upper abdominal quadrant. Stones were present in 64.6 per cent of the cases in this series in which the gallbladders were the site of the malignant growths. In their series, 65 per cent of all growths which were graded proved to be grade 3 or more. Whether stones may be an etiologic factor in the production of malignancy of the biliary tract is not known. The high incidence of stones in association with this condition, however, cannot be discounted and presents an important factor in deciding for or against their removal when first observed.

Tennessee State Medical Assn. Journal, Nashville

25: 293-338 (Aug.) 1932

Neurology Interpretation of Some of the More Common Clinical Conditions. C. C. Turner, Memphis.—p. 300.
"Sinusitis." E. Orr, Nashville.—p. 306.
Intestinal Obstruction: Report of Unusual Case. J. P. Baird, Dyersburg. —p. 312.
Five Hundred Appendix Cases. R. A. Barr, Nashville.—p. 320.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

40: 463-522 (Sept.) 1932

Implantation of Fallopian Tube into Uterus with Presentation of New Method. R. E. Watkins, Portland, Ore.—p. 463.
Volvulus of Sigmoid. C. F. Dixon and J. A. Bargen, Rochester, Minn. —p. 470.
Aneurysms of Arteries Amenable to Surgical Procedure. L. P. Bell and R. S. Tillotson, Woodland, Calif.—p. 475.
Laryngeal Pathology: Its Etiology and Relation to Malignant Disease of Larynx. E. F. Ziegelman, San Francisco.—p. 483.
Relationship of Sympathetic Parasympathetic System to Thyroid Disease. L. F. Barker, Baltimore.—p. 489.
Exophthalmic Goiter in Children: Review of Ninety-One Cases. F. W. Rankin and J. T. Priestley, Rochester, Minn.—p. 498.
Comparison of Goiters from State of Minnesota with Those from Canton of Bern, Switzerland. C. O. Rice, Minneapolis.—p. 506.

West Virginia Medical Journal, Charleston

28: 385-432 (Sept.) 1932

*Problems in Surgical Treatment of Carcinoma of Large Bowel. F. W. Rankin, Rochester, Minn.—p. 385.
*Cancer of Stomach. J. S. Horsley, Richmond, Va.—p. 393.
Will This Patient's Heart Stand an Anesthetic? O. B. Biern, Huntington.—p. 398.
Coronary Thrombosis. H. G. Thompson, Charleston.—p. 402.
Undulant Fever. A. J. Burkholder, Layland.—p. 404.
Sodium Iodide in Treatment of Herpes Zoster. H. T. Phillips and W. J. Morginson, Wheeling.—p. 405.
A Hodgepodge on Endocrinology. C. H. Maxwell, Morgantown.—p. 407.
Social Insurance Undermines National Character. E. H. Ochsner, Chicago.—p. 418.

Surgical Treatment of Carcinoma of the Large Intestine.—Rankin states that to sum up the diagnostic characteristics of carcinoma in any segment of the colon, the most significant early symptoms are: (1) change in intestine habit, as evidenced by increased irritability, such as some type of diarrhea, usually called by the layman "mucous diarrhea," or alternating periods of diarrhea and constipation; (2) localizing pain or tenderness, not of marked severity but without a tendency to disappear; (3) profound anemia not associated with visible loss of blood, and (4) acute, subacute or chronic obstruction. When such a chain of symptoms presents itself, immediate and complete examination of the entire gastro-intestinal tract by a competent roentgenologist is imperative. One cannot deprecate too strongly the usual textbook symptoms of loss of weight, cachexia, and dehydration as being pathognomonic of carcinoma of the large intestine. They are, in effect, evidences of advanced malignancy with possible metastasis and signposts of impending dissolution. To the suggestive clinical history, the confirmatory evidence furnished by roentgenologic examination is indispensable. Roentgenologic examination should disclose the presence or absence of growths beyond the juncture of the middle third of the sigmoid with its lower third. In the roentgen-ray laboratory of the Mayo Clinic, an accurate diagnosis of organic lesions of the large intestine, verified at operation, has been made in more than 95 per cent in all cases observed in the last three years. The realization of this high degree of perfection in the recognition of lesions of the colon has been the result of painstaking study, not only by fluoroscopic visualization and interpretation of the films, but by recognition of other factors equally significant. To attain the highest success, accurate preliminary preparation of the colon is essential. Proper cleansing by repeated washings and purgations, leaving the colon empty, is the primary requisite. Provided the intestine is empty and the patient is able to retain the barium clysma, diagnostic efficiency is in direct proportion to the proficiency of the examining physician. It should be emphasized that for diagnosis of organic lesions of the large intestine, ingestion of the meal by mouth is not only worthless but is frequently highly dangerous, in that it is likely to superimpose an acute intestinal obstruction on a chronic one. This is not a theoretical objection to this method; it is an actual experience in practically all roentgen-ray laboratories yearly. The practice should be summarily condemned, and the roentgenologist should accept this responsibility and in the future should recognize the importance of not administering mediums by mouth for the diagnosis of lesions of the colon. The characteristic canalization of the lumen of the intestine may be visualized under the fluoroscope and the rough, jagged contours of its margins, associated with the firm, knotty consistency of the mass which is frequently felt, are the cardinal differential characteristics of a malignant lesion. That an accurate anamnesis and careful examination should be closely associated with the laboratory diagnostic aids is a generalization that scarcely need be made. However, the author believes that as the profession becomes more "colon conscious" and insists on the examination of the large intestine as a part of the general physical examination, further diagnostic advances will insure a higher percentage of earlier diagnoses and satisfactory extirpations.

Cancer of Stomach.—Horsley believes that the hope for reducing the enormous mortality from cancer of the stomach lies, first of all, in early diagnosis and in applying the only known satisfactory treatment, partial or total gastrectomy. In patients who are upward of 65 years of age, the operation should preferably be done under local anesthesia. In elderly patients, cancer is often not of malignant or rapid growth as in younger patients. Sometimes a growth that is far advanced and easily palpable may in the elderly be satisfactorily removed with an excellent chance of relief and some possibility of cure, though the ideal is, of course, to perform the operation in as early a stage of the disease as possible.

Wisconsin Medical Journal, Madison

31: 586-667 (Sept.) 1932

Wisconsin Cancer Survey: Preliminary Statement. W. D. Stovall, Madison.—p. 595.
Cancer Survey of Wisconsin, 1931, Made by the American Society for Control of Cancer, New York, Prepared by F. L. Rector.—p. 597.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Tuberculosis, London

26: 107-158 (July) 1932

Vaccination Against Tuberculosis with B C G: Present State of the Question. A. Calmette.—p. 115.
Tuberculosis Infection in Infancy and Childhood. D. R. Hamilton. —p. 118.
The Tuberculosis Preventorium. N. Tattersall.—p. 121.
Eradication of Bovine Tuberculosis. J. W. McIntosh.—p. 127.
Tuberculosis Problem in Jersey. P. J. Marett.—p. 129.

Edinburgh Medical Journal

39: 461-532 (Aug.) 1932

Toxic Goiter: Survey of Cases Treated During Ten Years. J. Eason and H. L. Wallace.—p. 507.

39: 533-600 (Sept.) 1932

*The Human Heart in Anesthesia: Electrocardiographic Study. I. G. W. Hill.—p. 533.
*The National Consumption of Carbohydrates in Relation to Disease. J. H. P. Paton.—p. 556.
*Study of Peptic Ulcer. D. M. Dunlop and R. M. Murray-Lyon.—p. 571.

Human Heart in Anesthesia. — Electrocardiograms were taken by Hill in a series of forty-one patients under anesthesia —in most, both during induction and throughout operation. The anesthetics used were chloroform, ether, gas and oxygen, and ethyl chloride. In eight of sixteen cases in which chloroform was used for induction gross disturbances of cardiac action were produced. The commonest abnormality (seven cases) was the production of multiple ventricular extrasystoles. In one case paroxysms of supraventricular tachycardia alternated with the extrasystolic disturbance. In one case an exaggerated "vagal" arrhythmia appeared, with phasic variation in rate and in the P waves. In general, the disturbances were a feature of the period of induction and passed off with deepening anesthesia. They were not related to operative procedures other than direct vagal stimulation but were increased by struggling on the part of the patient. They usually occurred in healthy hearts, and were unassociated with untoward clinical circulatory symptoms. There was no interference with the course of the anesthesia in any of the cases showing these disturbances. It is suggested that these extrasystolic disturbances in man correspond to the "prefibrillation" phase observed in the cat. Their appearance soon after induction, their relation to the depth of anesthesia, to struggling, and to vagal stimulation, and their transient nature are all in harmony with this view. Their clinical significance in the causation of "chloroform syncope" is discussed. Patients under other anesthetics showed only minor abnormalities—fluctuations in rate, abolition or inversion of the P waves, nodal rhythm with negative P-R intervals, or aberration of ventricular complexes. A conspicuous feature in cases in which gas and oxygen anesthesia was used was the occurrence of marked but transient slowing of the heart early in induction; this was not due to atrioventricular heart-block. In some cases, slowing of the heart followed traction on the carotid vessels or interference with the recurrent laryngeal nerves. But in general, operative manipulations (opening of the peritoneum, ligature of cystic vessels and duct, dilatation of the anal sphincter, thyroidectomy) were without influence on the heart.

Carbohydrates in Relation to Disease. — According to Paton, modern consumption of carbohydrates is excessive, and this excess is largely the result of the addition to the diet of steadily increasing quantities of cane sugar. There is considerable clinical evidence that this excess is producing harmful effects in several directions. It affords some explanation of the high rate of incidence of severe catarrhal disorders, of the frequency of acidosis in the modern child, of the prevalence of rickets and dental caries and of the increasing death rate from diabetes and cancer. Excess of dextrose absorption is probably one etiologic factor in the production of diabetes and may be an accessory factor hastening death in malignant disease. Excess of carbohydrate in the diet has, it would seem, so modified the "soil" that the prevalence of certain disease states is increasing. Considerations advanced by the author suggest that restriction in the intake of carbohydrates, and especially of cane sugar, with the substitution of more animal fats as sources of energy and of fresh natural foodstuffs in the diet would result in definite improvement in the standard of national health.

Study of Peptic Ulcer.—Dunlop and Murray-Lyon studied 181 cases of definite peptic ulcer and 72 cases in which the diagnosis could not be established with certainty. Occupations involving irregularity of meals appeared to be an important etiologic factor. Gastric ulcer as opposed to duodenal ulcer was more common in the female cases. A marked degree of hyperchlorhydria was present in the male cases. Purely medical treatment resulted in the apparent cure of 48.7 per cent of the patients traced and in improvement of 28.9 per cent; 22.4 per cent were unimproved. The duration of symptoms before adequate treatment was undertaken had an important bearing on the therapeutic result. The authors believe that the risk of alkalosis developing under intensive treatment with alkalis is slight.

Glasgow Medical Journal

37: 73-136 (Aug.) 1932

St. Bartholomew's Hospital, 1880 to 1930. D. Power.—p. 73.
*End-Results of Tonsils and Postnasal Adenoid Operations. J. K. Love, G. A. Brown and J. Adam.—p. 103.
Up-Country Life in China. W. C. Grosvenor.—p. 112.

Tonsils and Postnasal Adenoid Operation.—Love and his associates present the results of an investigation that upholds the value of the limited operation on adenoids when tonsils and lymph nodes are not obviously diseased (and mere size does not indicate disease), and that such operations bring improvement in general health and help to prevent trouble in the ears and teeth. That they are of value in diminishing the incidence of infections is open to doubt. The authors believe that what is not open to doubt is that it is time the attention of the profession was turned to prophylaxis.

Indian Medical Gazette, Calcutta

67: 421-480 (Aug.) 1932

*The Anemia of Pregnancy. N. Gupta.—p. 421.
*Clinical Studies in Malaria by Cultural and Enumerative Methods: Second Series. R. Knowles and B. M. das Gupta.—p. 432.
Dysentery in Burma (Military Stations), with Note on Some Postdysenteric Infections. R. C. Wats and M. Jafar.—p. 446.
Preliminary Note on Absorption of "Makaradhwaja" (Sulphide of Mercury). R. N. Chopra and B. Mukherjee.—p. 448.
Rabies in Mongoose: Reports from Records, Including Report on First Positive Brain of Mongoose Examined at Kasauli: Comments Including Speculation and Bearing on Treatment. S. D. S. Greval.—p. 451.

The Anemia of Pregnancy. — Gupta points out that the symptom-complex of anemia of pregnancy is a manifestation of pathologic changes in the different tissues as evidenced by hemosiderosis, erythrophagocytosis and increase of cells of the reticulo-endothelial system and foci of myeloid changes in the spleen and liver. Defective hematopoiesis is due to the factors of (1) inadequate nutrition, (2) social and environmental conditions, (3) lack of antenatal care, and (4) preexisting anemia and a possible defect in the blood-forming organs following anemia, caused by tropical diseases. One or another, or a group of them in a condition like pregnancy upsets the balance of the hematopoietic system, and abnormal corpuscles are thrown into the circulation, to be destroyed by the reticulo-endothelial cells, which are increased in this condition. Primiparas suffer most, but the severity of the anemia is not affected by age or parity. On the other hand, nutrition and the mode of living, social and economic conditions, and early antenatal care markedly influence the severity of the anemia. It is not so much poverty but injudicious dieting which is important. There is an underlying sepsis, probably from the intestine by a quantitative increase of bacterial contents and their extension to usual sites. No particular bacterium is responsible for this. General leukocytosis with relative increase of neutrophils is an evidence of sepsis. Hematologic and histopathologic observations in the anemia of pregnancy are similar to those of the pernicious anemia of the Combe-Addison type. Leukopenia was absent in the majority of the author's cases of anemia of pregnancy.

Clinical Studies in Malaria.—Knowles and das Gupta present the results of clinical studies which show that there is a tendency to spontaneous cure and disappearance of para-

sites without treatment in cases of infections with Plasmodium vivax and Plasmodium falciparum. Persons infected with Plasmodium malariae do not show this tendency. Here what occurs is (1) a stage of fever, and often high fever, associated with relatively low parasite counts, followed by (2) a prolonged period during which the patient is afebrile, but a low grade of parasite infestation continues. Gametocyte production may appear quite early in infections with Plasmodium vivax and Plasmodium malariae, and the old-fashioned view that gametocytes are produced only at a late phase when the patient's resistance to infection is rising is certainly incorrect. There appears to be some biologic factor in the person who affects the production or nonproduction of gametocytes. Some persons are good "gametocyte-producers"; others are poor "gametocyte-producers." Gametocytes are usually produced in relatively large numbers in infections with Plasmodium malariae. The old-fashioned view that gametocytes of this species are rare is undoubtedly incorrect. In cases of blackwater fever in which administration of quinine precipitates hemoglobinuria, the practitioner should remember that there are antimalaria drugs other than quinine which may be safely prescribed. Of these, the one which appears to be especially suitable is quinidine.

Journal of Laryngology and Otology, Edinburgh

47: 589-656 (Sept.) 1932

Notes on Case of Acusticus Tumor in Which Both Auditory Nerves Were Involved by Separate Growth. A. de Klejn and A. A. Gray. —p. 589.
*Pathologic Changes in Auditory Nerve in Otosclerosis and Their Significance Clinically, Especially with Regard to Paracusis Willisii. A. A. Gray.—p. 598.
Mouth Breathing and Nasal Obstruction. W. W. James and S. Hastings. —p. 614.

Auditory Nerve in Otosclerosis.—Gray points out that in otosclerosis there is a degeneration of the fibers of the cochlear nerve, which appears first in the medullary sheath and neurilemma, and later in the axis-cylinder. This process occurs independently of the fixation of the stapes or of the bony change in the capsule of the labyrinth, and it probably precedes both. Deafness occurs as a result of the degeneration of the fibers of the cochlear nerve before the stapes is fixed. The clinical picture of otosclerosis is produced, for the most part, by the degeneration of the cochlear nerve, and only to a minor degree by the fixation of the stapes. The latter may add to the deafness already present and may also account for the relatively prolonged bone conduction. Paracusis Willisii, tinnitus and, for the most part, also the deafness, are due to the diseased condition of the nerve. The diminished secretion of wax in the meatus, the sluggish vasomotor reaction and accompanying diminished sensitiveness of the tympanic membrane, the bony change in the capsule of the labyrinth and the degeneration of the cochlear nerve are independent of each other and do not stand in the relationship of cause and effect. They are called into existence by some common factor which is probably to be looked for in the vasomotor arc which controls the nutrition of the structures of the organ of hearing as a whole. These changes in the various structures are all degenerative in character and not inflammatory. They may occur in varying degree in the different structures in different individuals. Hence the clinical picture of otosclerosis varies within fairly wide limits in different cases.

Journal of Neurology and Psychopathology, London

13: 1-96 (July) 1932

Hemorrhagic Affection of Corticoneostriatal Site Revealed Clinically by Acute and Fatal Chorea. L. van Bogaert and I. Bertrand.—p. 1.
*Observations on Diagnosis of Spinal Block by Means of Lipoidol. H. H. Moll.—p. 14.
Pedigree Showing an Atypical Form of Hereditary Optic Atrophy Exhibiting Apparent Polymorphism. W. H. de B. Hubert.—p. 32.
Occult Lumbosacral Meningocele. S. A. K. Wilson and C. P. G. Wakeley.—p. 45.

Diagnosis of Spinal Block by Means of Iodized Poppy-Seed Oil.—According to Moll, the injection of iodized poppy-seed oil 40 per cent into the cisterna magna is a valuable adjunct to the diagnosis of spinal block. Although manometric and serologic examinations of the cerebrospinal fluid may often give all the information required, an examination with iodized poppy-seed oil provides additional and unequivocal evidence of spinal block and is a means of accurately localizing the level of obstruction. A negative result (no arrest of the oil) can usually be taken as sufficient proof that there is no spinal block. Partial or even complete obstruction to the flow of oil may be brought about by conditions other than spinal tumor, and among the conditions that offer the greatest difficulty in the differential diagnosis are pachymeningitis, syringomyelia and meningitis serosa circumscripta. As a rule an injection of iodized poppy-seed oil into the cisterna magna, if properly carried out, is a perfectly safe procedure and does not give rise to any marked or lasting symptoms of reaction. Caution, however, should be taken in inflammatory conditions of the cord and meninges, as in these cases the iodine component of the oil may have a congestive action and may lead to an aggravation of symptoms.

Journal of Physiology, London

75: 381-490 (Aug. 10) 1932

Influence of Toxemia on Carbohydrate Metabolism. B. Corkill.—p. 381.
Effects of Components of Lecithin on Deposition of Fat in Liver. C. H. Best and M. Elinor Huntsman.—p. 405.
Observations on Extracts of Beef Adrenal Cortex and Elasmobranch Interrenal Body. R. A. Cleghorn.—p. 413.
Deterioration of Fibrinogen and Thrombin. J. O. W. Barratt.—p. 428.
Influence of Electrolytes on Function of Intestinal Mucosa. H. E. Magee and K. C. Sen.—p. 433.
Identification of Lucas's α Excitability. W. A. H. Rushton.—p. 445.
Actions of Adrenalin and Acetylcholine on Isolated Pulmonary Vessels and Azygos Vein of Dog. K. J. Franklin.—p. 471.
Functions of Great Splanchnic Nerves. D. T. Barry.—p. 480.

Journal of State Medicine, London

40: 435-496 (Aug.) 1932

Tuberculosis in Relation to Social Welfare. D. Bates.—p. 435.
Contribution of Bacteriology to Public Health Problems. A. B. Mitchell. —p. 443.
Pathology in Relation to Public Health. A. M. Drennan.—p. 449.
Health of Industrial Worker. T. Oliver.—p. 454.
*Industrial Electrial Accidents in Their Neurologic Aspect. M. Critchley. —p. 459.
The Tuberculosis Museum. S. H. Daukes.—p. 471.
Psychology of the Consumptive. S. V. Pearson.—p. 477.
Municipal Chiropody. A. T. W. Powell.—p. 486.
The Rat Débâcle. A. M. Hogarth.—p. 490.

Electrical Accidents.—Critchley gives the following instructions for the immediate treatment of electrical shock: Release the victim but avoid sustaining a shock oneself. Any dry nonconductor may be used to move the victim or the live conductor. If both the victim's hands are grasping the live conductor, free them one at a time. If necessary, shut off the current. The nearest switch should be opened. If it is necessary to cut a live wire, use a wooden-handled ax, turning away the face to avoid the flash. Put a finger in the victim's mouth to remove teeth, gum or tobacco. Lay the patient on the abdomen, one arm extended upward, the other elbow flexed. Rest the face on the hand so that the mouth and nose are free. Carry out artificial respiration, according to Schäfer's method, for at least three and a half hours. When the patient revives, keep him lying down. Keep him warm. Watch the respiration carefully lest it fail again.

Lancet, London

2: 325-376 (Aug. 13) 1932

Relation of Ultraviolet Light to Nutrition. Harriette Chick.—p. 325.
*Advances in Application of Skeletal Traction. T. H. Wilson.—p. 330.
Treatment of Narcolepsy with Ephedrine. H. Cohen.—p. 335.
*Treatment of Mental Disorders by Pyrexia Produced by Diathermy. C. B. Bamford.—p. 337.

Application of Skeletal Traction.—Wilson states that there are cases in which a fracture cannot be reduced by manipulation. Consequently, two courses are possible, either to perform an open operation for reduction or to produce a continuous long axis traction. The former always carries with it the risk of infection, so that the latter is to be preferred. But it is not always possible to maintain sufficient force by the older methods of traction applied to the skin, and skeletal traction offers a way of procuring the necessary force. There is again the possibility of infection reaching the bone but, on the whole, less possibility than in open reduction, especially if the wire method is used. Page maintains that the liability to infection depends on the amount of trauma produced when the pin or wire is inserted and by the dragging of the wire through the tissues and bone. Block and Koch performed a series of

experiments which showed that in the absence of suppuration only a very small cut through of the wire was found, but when infection was present the wire cut rapidly. Now, although Page has inserted the wire by using an electric drill, which presumably produces some necrosis of bone, he has never, over a period of eighteen months, seen infection in the track of the Kirschner wire. The author believes that there are no fractures which, needing skeletal traction, cannot have the Kirschner wire method applied to them, insuring every chance of reaching the same result as if older methods had been used, but with the smallest likelihood of infection. The only difficulties in the way of universal application of the method consist of expense and sterilization.

Treatment of Mental Disorders by Pyrexia Produced by Diathermy.—Bamford enumerates thus the advantages of the treatment of mental disorders by pyrexia produced by diathermy: 1. The pyrexia is under complete control throughout the treatment. Applications can be given at any time and to any number. 2. Prolonged treatment by this method does not produce physical prostration and weakness. 3. It is possible to give this mode of treatment to patients who are aged, marasmic, debilitated, or even affected with organic disease. Among the disadvantages of this form of treatment are the following: 1. It can be administered with safety only to patients who are quiet, restful and cooperative. 2. The great danger of burns due to motor restlessness seriously restricts the scope of the method. 3. There is no evidence in the author's experience to show that it is any more effective in producing a clinical remission than malaria.

Medical Journal of Australia, Sydney

2: 161-190 (Aug. 6) 1932

Recent Research and Vitamins. W. B. S. Bishop.—p. 161.
Random Thoughts on Sinus Infection. H. M. Jay.—p. 164.
Operative Treatment of Squint. B. Moore.—p. 166.
Arthritis Deformans. H. Pern.—p. 169.
Sodium Amytal as Sedative in Ophthalmic Surgery. C. Blakemore.—p. 174.

2: 191-220 (Aug. 13) 1932

The Bancroft Memorial Lecture. W. A. Osborne.—p. 191.
Prevention of Cancer of Skin and Buccal Cavity. E. H. Molesworth.—p. 196.
Remarks on Treatment of Buccal Cancer. L. M. McKillop.—p. 199.
Cancer of Buccal Cavity. B. Kilvington.—p. 202.
Spinal Anesthesia. R. F. Matters.—p. 203.
Diabetic Coma: Principles of Treatment Based on Analyses of Blood and Urine. W. W. Ingram and G. V. Rudd.—p. 204.

Practitioner, London

129: 209-304 (Aug.) 1932

Plea for Periodic Examination to Reduce Mortality from Cancer. M. Donaldson.—p. 209.
*Surgical Aspect of Toxic Goiter. J. B. Hunter.—p. 216.
Medical Treatment of Graves' Disease and Toxic Goiter. A. T. Todd.—p. 222.
Treatment of Drug Addiction: Review. E. W. Adams.—p. 234.
Seasickness. T. G. Maitland.—p. 251.
Subcutaneous Tuberculin Test. H. Sutherland.—p. 267.
Temperaments and Senses. E. A. Barton.—p. 278.
Some German Spas. R. S. Stevenson.—p. 286.
Development of Cardiovascular Renal Syndrome. R. E. Horsfall.—p. 292.

Surgical Aspect of Toxic Goiter.—According to Hunter, it is a difficult problem to determine the amount of thyroid to be removed in toxic goiter. No fixed numerical amount can be stated, each case being dealt with at the time. Those patients who have reacted well with compound solution of iodine are apparently persons in whom an involution process is rapidly produced in the gland, and it is possible that in them the removal of too much thyroid, together with a subsequent involution in the remaining glandular tissue, may produce a mild degree of myxedema. This myxedema, if occurring, can be controlled by thyroid extract, but it is doubtful whether this is altogether satisfactory. Those patients therefore in whom there has been evidence of marked involution changes under iodine treatment probably require less gland removed than the ones in whom iodine has produced little or no improvement. The gland itself, when cut across at operation, also gives some indication as to the amount of involution that has taken place under iodine treatment; this is more easily noted in the primary toxic cases, the involuted gland having much more colloid and the beefy appearance of the gland in untreated toxic goiter being absent. These considerations should help one at the time of operation, but nothing can be more disappointing than to find from the subsequent clinical picture that too little gland has been removed, and in the present state of knowledge it is as well to err by removing too much. In those cases of secondary toxic goiter in which a single adenoma is present, it must be remembered that the removal of the adenoma is not sufficient; the rest of the gland is almost certainly the seat of hyperplasia and must be dealt with in a similar manner to the primary condition.

South African Medical Journal, Cape Town

6: 451-482 (July 23) 1932

Eruptive Fevers of Typhus Group, with Notes on Fever of Group Observed in Southern Rhodesia. G. R. Ross.—p. 453.
Action of Homeria Lucasii. J. W. C. Gunn and Helen A. Brown.—p. 459.
Action of Homeria Bulbifera and Homeria Aurantianica. J. W. C. Gunn.—p. 461.
Some Cases of Abscess of Lung. S. F. Silberbauer.—p. 461.

Journal of Oriental Medicine, South Manchuria

16: 61-70 (May) 1932

Changes in Iron Metabolism After Extraction of Spleen. K. Suno.—p. 61.
Effects of Removal of Pituitary Body and Injection of Pituitary Preparations on Function of Reticulo-Endothelial System. S. Takahashi and S. Kuga.—p. 63.
Evaluation of Vermifuges by Means of Leeches. N. Wada and B. Terada.—p. 64.
Virus of Typhus Fever in Urine of Animals. T. Komiyama and M. Ommyoji.—p. 65.
Report on Dysentery in Children Caused by Bacillus Sonne III. Y. Watanabe.—p. 65.
Studies on Toxin of B. Typhosus: Part I. Skin Reaction to Culture Filtrate of B. Typhosus and Various Conditions of Production of Toxin. M. Yato.—p. 66.
Gonorrheal Epididymitis. S. Kitamura and M. Motohata.—p. 67.
Pyelography with Lipiodol. H. Yanagihara and T. Miyaia.—p. 68.

Nourrison, Paris

20: 261-324 (Sept.) 1932

*Treatment of Extensive Infectious Congenital Syphilis of the New-Born by Liposoluble Bismuth Salts. E. Lesné and Linossier-Ardoin.—p. 261.
*Dermatitis Exfoliativa Neonatorum. G.-L. Hallez.—p. 270.
Syphilitic Fetal Peritonitis. Horia Slobosiano.—p. 286.
Beriberi in Nurslings. P. R. Keizer.—p. 291.

Treatment of Syphilis of the New-Born.—Lesné and Linossier-Ardoin recommend liposoluble bismuth salts for the treatment of congenital syphilis of nursling in cases in which there are grave visceral lesions in addition to extensive mucocutaneous lesions. Liposoluble bismuth salts, while more spirocheticidal than mercurial preparations, are less toxic than arsphenamines, the use of which is dangerous and sometimes fatal in these cases. The authors have used a liposoluble preparation of bismuth carbonate with camphor containing 0.01 Gm. of metallic bismuth per cubic centimeter, injected intramuscularly in an average dose of 5 mg. weekly per kilogram of weight. The therapeutic results were much the same as those produced by arsphenamine medication but without a single unfavorable reaction. In all cases the clinical signs receded quickly and the serologic reactions became negative. Three cases are reported. The authors admit the superior efficacy of arsphenamine and its valuable eutrophic action and continue to use it in attenuated and average forms of congenital syphilis but they think that in grave forms its use endangers life. Liposoluble bismuth salts combat the immediate dangers by acting on the visceral lesions as well as on the mucocutaneous and osseous lesions. After one or several series of bismuth medication, when the general condition of the infant permits it, one may continue the treatment with arsphenamines.

Dermatitis Exfoliativa Neonatorum.—Hallez discusses the symptomatology, pathology and differential diagnosis of this disease. It should not be confused with erythrodermia desquamativa, as has frequently been the case, especially in France, where the disease is extremely rare. In erythrodermia desquamativa the erythema usually appears first in the anogenital region, while in dermatitis exfoliativa it usually starts on the face, especially around the mouth. The former is sometimes accompanied by seborrhea, but there are never any bullae and Nikolsky's sign is absent. The mucosa is never involved, as

occasionally happens in dermatitis exfoliativa. Differentiation from syphilitic palmoplantar pemphigus, traumatic and congenital epidermolysis bullosa, and erythrodermia congenitale ishthyosiforme with hyperepidermotrophy is briefly reviewed. The true nature of dermatitis exfoliativa neonatorum cannot as yet be defined. The author thinks the staphylococcus is a too common germ to be considered the sole agent responsible for a dermatitis with such special characteristics as this disease. He thinks that it may be provisionally classed with malignant bullous dermatitis and that the future will tell whether it may be considered a grave form of pemphigus neonatorum evolving under special circumstances. In treatment it is of foremost importance to allow the child to continue feeding at the breast and to insure the utmost cleanliness. The use of sterilized linen is advised and application of sterilized compresses of oleocalcic liniment on the diseased parts and moistening of skin with physiologic solution of sodium chloride. The infant should not be bathed but the dry parts should be powdered with zinc peroxide. Placing the child in a box of bran which is frequently renewed may be done if the bran is sterilized. Secondary pyodermitis should be treated with greatest care; furuncles should be opened by galvanocautery and dressings with vaccines applied.

Presse Médicale, Paris

40: 1413-1428 (Sept. 17) 1932

*Cancer of Testicle with Superacute Abdominal Syndrome. A. Gosset, G. Loewy and P. Funck-Brentano.—p. 1413.
Semeiologic and Prognostic Value of Alternating Pulse. C. Lian, P. Merle and M. Albeaux-Fernet.—p. 1415.
*Subacute Inguinal Lymphogranulomatosis: Relation to Anorectal Syphiloma of Fournier. E. de Gregorio.—p. 1416.
Absorbent Cotton Apparatus of Dujarier in Fractures of Humerus. G. Rouhier and P. Labignette.—p. 1418.

Cancer of Testicle with Superacute Abdominal Syndrome.—Gosset and his associates report the case of a man, aged 26, with a seminoma masked from the clinical point of view by a recent surgical cicatrix, who presented an acute abdominal syndrome of the type of hemorrhagic pancreatitis, caused by an inflammation of the celiac plexus due to metastasis in the abdominolumbar lymph nodes. The symptoms at the time of examination were acute paroxysmal pains in the epigastric region, frequent vomitings streaked with blood, and intestinal occlusion. A slight difference in the consistency of the left testis was attributed to scar tissue from a recent operation for vaginal hydrocele. Laparotomy revealed nothing that could account for the acute abdominal syndrome. Necropsy disclosed a seminoma of the left testis with hepatic and pulmonary metastasis and an enlarged mass of lymph nodes pressing against the aorta. The exceptional aspect of this case is the location of the pain. In all case reports reviewed by the authors in which the pain was located high, it was in the lumbar region. However, invasion of the lymph nodes located high in the abdomen, in the course of disease of the testes, has been reported and the inflammation of the celiac plexus is readily explained by the intimate contact of the lymphatic system with the abdominolumbar sympathetic system. Another unusual aspect of the case was that the seminoma was so small that the exterior morphology of the testes was not changed and the slight irregularity of the consistency of the left testis was therefore attributed to a surgical cicatrix.

Subacute Inguinal Lymphogranulomatosis.—Gregorio says that the condition of hyperplastic infiltration of the rectum which Fournier described as anorectal syphiloma, considering it a manifestation of tertiary syphilis, is now regarded by most authors as a manifestation of subacute inguinal lymphogranulomatosis. The infection is thought to spread from the inguinal lymph nodes to the anorectal lymph nodes, producing a circulatory stasis which results in rectal infiltration. This opinion finds support in the almost constantly positive results with the intradermal test of Frei and the negative reactions with Ito's test. Lack of syphilitic antecedents and negative serologic reaction are further support. The author thinks that it is difficult to deny a syphilitic origin because most of the patients have a positive serologic reaction and it is difficult to determine whether those with negative reactions were previously infected. Certain cases of rectal stenosis with ulcerating and elephantiasic lesions are much improved by antisyphilitic treatment. Localization of the stenosis in the region of the internal sphincter, 3 or 4 cm. from the anal orifice, may naturally result from an infection of the anorectal lymph nodes, and when this is the only symptom it indicates direct infection of these lymph nodes. This is more frequent in women because of the location of the point of entry of the infection. The intradermal reactions of Frey show that lymphogranulomatous infections are frequent in women, but they also prove the frequency of chancroidal infections. Admitting an approximately equal frequency of these two infections in the sexual diseases of women and knowing the mode of life of these individuals in most cases, it would be difficult and sometimes impossible to single out one or the other of these diseases as the cause of the isolated rectal manifestations sometimes constituting the anorectogenital syndrome. A lymphatic disturbance may readily be admitted to explain the production of the syndrome, but the studies that have been made to date do not permit the determination of the causal organism because other bacteria would be left out which in certain cases manifest themselves by an active intervention.

Pediatria, Naples

40: 965-1028 (Sept. 15) 1932

*Disturbances of Sleep in Children with Malaria. G. Genoese.—p. 965.
Calcium Therapy and Vitamin D. L. Moro.—p. 975.
Bronchial Asthma in Infancy. L. Lattes.—p. 999.

Disturbances of Sleep in Children with Malaria.—Genoese reviews the literature of malaria in children and discusses their tendency to somnolence. The author states that this tendency may occur during the malarial attack and during convalescence; it is especially in evidence when malaria has caused serious anemia. Somnolence in the nursling is more intense during the cold stage, whereas sleep during the hot stage is interrupted by many disturbances; the child cries, refuses to take the breast, writhes and assumes peculiar positions, and has tremors or subsultus, often followed by vomiting and diarrhea. In the defervescent stage the nursling sleeps quietly for hours. It does not waken to take the breast but must be awakened. In older children, somnolence is more pronounced during the hot and defervescent stages. The nocturnal sleep of neuropathic children is generally disturbed by verbigeration, peculiar gestures and positions, and hallucinations representing animal forms followed by hallucinatory cutaneous and abdominal sensations of itching, pricking and the presence of foreign bodies. The author cites two cases in which the nervous systems of both children were seriously injured. He concludes that the toxins of the malarial parasite act primarily on the choroid plexuses and cause quantitative and qualitative modifications of the cerebrospinal fluid. An increase of the pressure of the fluid during lumbar puncture is a definite symptom of malaria in children. Through its ventricular seat the regulatory center of sleep becomes highly sensitive to these modifications.

Archiv für Kinderheilkunde, Stuttgart

97: 129-192 (Sept. 9) 1932

Technic of Suggestion Therapy in Children. F. Hamburger.—p. 129.
Influence of Ultraviolet Irradiation on Growing Organism (Rats) During Various Diets. H. Bischoff.—p. 136.
*Cause of Death in Acetonemic Vomiting. F. Goebel.—p. 144.
Epidemiology of Measles. A. Dormidontow.—p. 148.
Viscosity Curves of Plasma and Serum in Normal and Atrophic Nurslings. J. Surányi and P. Sonnauer.—p. 152.
Pneumonia During Childhood: Pnuemonia and Appendicitis. R. Kochmann.—p. 157.
Influence of Various Salts on Nitrogen Metabolism in Nurslings. G. Weber.—p. 160.
*Dermatitis Exfoliativa and Pemphigus. H. Asperger.—p. 167.

Cause of Death in Acetonemic Vomiting.—Goebel points out that the cause of death in acetonemic vomiting is as yet not entirely understood. A patient may die even after vomiting and ketonemia have already disappeared and after sugar and water can again be taken orally. The postmortem observations do not indicate the cause of death, since the fatty liver is surely not the primary cause of a fatal metabolic disturbance but rather a secondary result of starvation and intoxication. After evaluating the theories of others, who consider central nervous disturbances, infection, encephalitis or exsiccosis as possible causes of death, he describes the clinical history and the postmortem examination of a case that he observed. He reaches

the conclusion that, in acetonemic vomiting, exsiccosis is the essential cause of death and that neither infection nor encephalitis need be present.

Dermatitis Exfoliativa and Pemphigus.—Asperger gives the clinical history of a premature birth of six and one-half months. In the beginning there existed the typical aspects of dermatitis exfoliativa. Especially demonstrative for this disorder was the rapid spread over the entire body and the symptom of epidermolysis, which most authorities consider pathognomonic for the dermatitis. That the disease did not as usually begin near the mouth but rather on the hand does not contradict the diagnosis, since such behavior has been observed before. The pemphigus that developed subsequently was typical in the form, the surroundings and the contents of its vesicles, and also in that the vesicles did not show a tendency to spread peripherally. That a transition from dermatitis to pemphigus did actually exist in this case is proved by the fact that pemphigus developed at a time when the symptoms of the dermatitis, although gradually improving, were still in existence, and that the vesicles in the beginning were still extremely large and numerous but then became constantly smaller and rarer. Exactly the reverse, namely, a transition from pemphigus to dermatitis exfoliativa, has been repeatedly reported, but a transition from dermatitis exfoliativa to pemphigus has hardly ever been observed. But in the case described by the author there was yet another factor that speaks for a relationship between the two diseases. In the obstetric department from which this child came, there were at that time three cases of pemphigus, two of which were comparatively harmless but the third, for a time, had the appearance as if a dermatitis exfoliativa might develop, but epidermolysis did not occur. The author thinks that the explanation of the case observed by him is the same as the answer to the problem why, in the course of an epidemic, there may develop pemphigus and again, in rare instances, a dermatitis exfoliativa. He assumes that there are either fluctuations in the virulence of the pathogenic agent or differences in the predisposition of different persons.

Archiv für klinische Chirurgie, Berlin

171: 643-832 (Sept. 3) 1932. Partial Index

*Gastric Ulcer Disease in Its Different Stages. J. Doberer.—p. 643.
Peritoneal Infections After Gastric Operations for Carcinoma, Gastric and Duodenal Ulcer. R. Friedrich and H. Weber.—p. 673.
*Pathogenesis of Appendicitis. C. Böhne.—p. 692.
Diseases of Spleen Surgically Considered. A. Troell.—p. 734.
Mesenteric Vein and Portal Vein Thrombosis in Appendicitis. A. D. Otschkin.—p. 758.
Benign Tumors of Stomach. B. Neumann.—p. 783.

Gastric Ulcer Disease in Its Different Stages.—Doberer states that every gastric or duodenal ulcer is preceded by a stage of inflammation of the stomach and the first portion of the duodenum. This stage is characterized by changes in the gastric mucosa, redness of the gastric serosa (red stomach), presence of perigastric and periduodenal adhesions and inflamed lymph nodes. He suggests for it the name adhesive gastroduodenitis to emphasize the essential characteristics of this type of inflammation. This stage may be followed by the development of a gastric or duodenal ulcer. Erosion, simple ulcer, ulcerative gastritis, and callous ulcer are the different stages of ulcer disease. The symptom complex of adhesive gastroduodenitis is present in every case of gastric or duodenal ulcer. The timely recognition and careful treatment of adhesive gastroduodenitis is the best prophylaxis against the development of gastric or duodenal ulcer. Callous ulcer is always an operative lesion. Resection is generally recognized as the method of choice. Gastro-enterostomy is justified only in cases of stenosing callous duodenal ulcers in which gastric resection cannot be carried out. Ulcer excision may be occasionally done in such cases. A similar excision of inoperable ulcers of the cardia is to be regarded as a dangerous procedure. The existence of an adhesive gastroduodenitis is a definite indication for a partial gastric resection, even if the ulcer is not found.

Pathogenesis of Appendicitis.—Böhne made an anatomic-pathologic study of 1,000 removed appendixes. Of these, 121 were subjected to a bacteriologic study. As a result of the author's observations, he shares with Ricker the view that acute appendicitis almost always begins as a localized process of the mucous membrane of the appendix. Local vascular disturbances are responsible for the further spread of the inflammatory process. Acute appendicitis is initiated not as a definite type, mild or severe, but, starting as a mild localized lesion, is capable of passing on to any degree of severity, from the mildest to the severest. The author does not share Ricker's theory of the nervous origin of vascular disturbances in appendicitis. The damaging factors, according to him, are to be seen in the direct effect of physical-chemical factors, of the effect of products of decomposition and of bacterial toxins on the capillary wall. A specific bacterial organism was not demonstrated.

Beiträge zur Klinik der Tuberkulose, Berlin

80: 277-402 (Aug. 3) 1932

Diagnosis and Treatment of Intrathoracal Dermoid Cysts. P. Starcke.—p. 278.
Tubercle Bacilli in Blood. J. Guischard.—p. 285.
*Surgical Treatment of Cavern Near Hilus. T. Plieninger.—p. 291.
Circumscribed Pleuritic Rest Conditions and Their Differential Diagnostic Significance. F. Kellner.—p. 297.
Clinical Investigations on Respiration and Blood Gases. K. Jansen, H. W. Knipping and K. Stromberger.—p. 304.
Deviation to the Left in White Blood Picture in Tuberculosis, with Special Consideration of Surgical Tuberculosis. F. Ramel.—p. 374.
*Tuberculosis and Deviation to the Left in White Blood Picture. Maria Walter.—p. 386.

Surgical Treatment of Cavity Near Hilus.—Plieninger points out that while peripheral cavities collapse readily under the influence of artificial pneumothorax, there are two factors that prevent collapse in the case of cavities near the hilus; namely, the large and rigid bronchial ramifications and the persisting diaphragmatic traction. During pneumothorax treatment an uncollapsed cavern involves great danger of dissemination, and in the cavern near the hilus this danger is especially great because of the constant tugging exerted on it by the diaphragm. To these causes the author ascribes the unfavorable results he obtained with pneumothorax treatment in several children and young persons, and he considers pneumothorax therapy contraindicated in patients with caverns near the hilus. Since the object of treatment should be immobilization and the motility of the diaphragm prevents this, he advises phrenico-exeresis. He gives a case history that illustrates the favorable effect of operative paralysis of the diaphragm. He thinks that with the aid of other measures, such as fixation of the diseased side of the thorax and abdominal respiration, phrenico-exeresis is the best means to effect immobilization in patients with caverns near the hilus.

Tuberculosis and Deviation to Left in White Blood Picture.—Walter observed deviation to the left in the white blood picture in the majority of cases of open tuberculosis, namely, in 86.2 per cent. In inactive cases of pulmonary tuberculosis deviation to the left was generally absent. In incipient tuberculosis, such as early infiltrates and beginning secondary infiltration, the deviation to the left was only slight. From these observations it is concluded that the deviation to the left in the white blood picture is a valuable aid in estimating the activity of a tuberculous process, in spite of the fact that absence of a deviation to the left does not entirely exclude activity. This limitation applies also to the sedimentation speed of erythrocytes. The degree of deviation to the left, which generally goes parallel with the severity of a disease, does not reach the extremely high values in tuberculosis that are observed in acute infectious diseases. However, in strongly progressive tuberculosis or in the forms with considerable tissue disintegration, the deviation to the left may reach a high degree, for which reason it is then of no value for the differential diagnosis, but in these cases the differentiation from other disorders can usually be based on the clinical aspects, roentgenograms and the examination of the sputum. Between the deviation to the left and the sedimentation speed of erythrocytes there is a certain, even if not an absolute, parallelism. The prognosis of tuberculosis, which is difficult even when all factors are taken into consideration, is aided by the hemogram so far as the inactive tuberculosis does not show a deviation to the left. A gradual recession of the deviation to the left can be considered as favorable; a persistance or an increase can be considered as unfavorable. In the treatment the deviation to the left is significant so far as an increasing deviation or a persistence of high or medium values, together

with an increased sedimentation speed, may indicate the necessity of an active or eventually a surgical intervention. In early infiltrates, the prolonged existence of a considerable deviation to the left makes pneumothorax advisable.

Deutsche medizinische Wochenschrift, Leipzig

58: 1391-1430 (Sept. 2) 1932. Partial Index

*Anatomic, Clinical and Roentgenologic Studies on "Hiatus Hernia." F. Sauerbruch, H. Chaoul and A. Adam.—p. 1391.
Reply to Studies on "Hiatus Hernia." G. von Bergmann.—p. 1397.
Remarks on Thoracoplasty. W. Kremer.—p. 1397.
Hysteria, Trauma or Epilepsy? E. Körner.—p. 1401.
Destruction of Diseased Vulvovaginal Gland by Means of Thermocautery. S. Serefis.—p. 1403.

Anatomic, Clinical and Roentgenologic Studies on "Hiatus Hernia."—After discussing the anatomy of the diaphragm, particularly of the esophageal hiatus, Sauerbruch and his associates discuss the various forms and the different theories of the hiatus hernias. They accept the so-called para-esophageal hernias, which may occur in various forms and sizes and which are of clinical as well as of surgical interest. They maintain that the new forms of hiatus hernias as described by Åkerlund, Berg and Knothe are not really hernias, but only epiphrenic protuberances of the esophagus, which, under certain conditions, occur during the act of deglutition. In addition to this, there also occur physiologic displacements of the cardial section of the stomach within the muscular cone that connects the diaphragm and the esophagus.

Jahrbuch für Kinderheilkunde, Berlin

136: 257-380 (Sept.) 1932

Clinical Aspects and Prognosis of Articular Rheumatism, of Chorea Minor and of Endocarditis in Children. E. Hässler and L. Möller.—p. 257.
*Treatment of Thrombopenic Purpura During Childhood by Means of Roentgen Irradiation of Spleen. H. Hippe and R. Kochmann.—p. 302.
Treatment of Mastoiditis. H. Zischinsky.—p. 310.
Experiences with Sugar Therapy in Pyuria in Children. E. J. Schmitz.—p. 329.
*Light Susceptibility and Rickets. K. Huldschinsky.—p. 346.
Blanching Capacity of Serum from Animals Experimentally Infected with Scarlet Fever. K.-H. Höffken.—p. 351.
Demonstration of Virus of Herpes and of Vaccine by Test on Cornea of Rabbits. K. Herzberg.—p. 365.

Treatment of Thrombopenic Purpura.—Hippe and Kochmann point out that roentgen therapy is only rarely resorted to in hemorrhagic diseases of children. This they consider surprising, since the efficacy of most other methods is usually doubtful and most physicians hesitate to resort to extirpation of the spleen. They obtained favorable results with roentgen therapy in seven cases. The common symptom of all these was sudden hemorrhages, either following acute infections (varicella, vaccination against smallpox, tonsillitis) or without special provocation. In one of the children nosebleed had been observed before, and in another child the family anamnesis revealed that both parents had suffered from epistaxis. In nearly all the children there were either petechial or extended hemorrhages under the skin, but the main symptom was in all instances hemorrhage from the nasal mucous membrane. The largest portion of the blood was usually discharged from the nose into the pharynx, was swallowed and later caused vomiting of blood, which sometimes was wrongly interpreted as being the result of gastric ulcer or of pulmonary hemorrhage. Although the blood was discharged only in drops, the persistence for several days led to great loss of blood, and the hemoglobin content, the erythrocytes and especially the thrombocytes decreased to extremely low values. In one instance the thrombocytes disappeared completely. Tamponade and the administration of substances such as epinephrine and calcium either had no effect whatever or were only temporarily effective. In only one instance was the intramuscular injection of normal horse serum effective. However, roentgen irradiation of the spleen regularly led to immediate and lasting hemostasis and to rapid increase of the thrombocytes to normal values. The authors advise not to lose time by first trying other therapeutic methods but to resort immediately to irradiation of the spleen. They applied from a distance of 30 cm., and through a filter of 0.5 mm. of copper and 1 mm. of aluminum, from 110 to 180 roentgens. This dosage never had injurious effects.

Light Susceptibility and Rickets.—Huldschinsky points out that the observation that dark races are especially susceptible to rickets when transplanted to a more moderate climate, whereas they are comparatively free from it in their native countries, speaks for an involvement of the skin in the pathogenesis of this disease, and he made tests to determine whether the light susceptibility of the skin is a factor in the pathogenesis of rickets. Theoretical reasoning indicates that such children are more susceptible to rickets whose skin does not readily react to the influence of light. The author tested the intensity of erythema developing under exposure to ultraviolet rays in children with and without rickets but obtained no evidence that a reduced sensitivity of the skin to ultraviolet radiation is a factor in the pathogenesis of rickets. On the contrary, some of the rachitic children were more sensitive than the nonrachitic children.

Klinische Wochenschrift, Berlin

11: 1529-1568 (Sept. 10) 1932

Hypophysis and Metabolism of Protein Bodies and of Carbohydrates. B. A. Houssay.—p. 1529.
*Porphyrin in Blood and in Bile. A. A. Hijmans van den Bergh, W. Grotepass and F. E. Revers.—p. 1534.
*Reticulo-Endothelial System and Operation. L. Klotz.—p. 1536.
Influence of Alkaline Waters on Purine Metabolism. E. Hesse and K. Nawrath.—p. 1538.
Aspects of Hemochromatoses. Slauck.—p. 1540.
Bulbar Hypertension. F. Salus.—p. 1542.
Comparative Investigations on Action of Homologous and Heterologous Serums in Diphtheria. H. Baar.—p. 1545.
*Treatment of Malignant Diphtheria by Means of Blood Transfusion. H. Benedict.—p. 1549.
Determination of "Normal" Bromine Content of Blood. H. Fleischhacker and G. Schneider.—p. 1550.
Microdetermination of Bromine in Blood and in Other Organic Material. L. Pincussen.—p. 1550.

Porphyrin in Blood and in Bile.—Hijmans van den Bergh and his collaborators describe experiments that proved that the perfused, surviving liver is capable of changing protoporphyrin into coproporphyrin. Although this does not definitely demonstrate that the coproporphyrin of human bile develops from the protoporphyrin of the erythrocytes, it appears likely on the basis of the reported experiments.

Reticulo-Endothelial System and Operation.—Klotz tested the storage capacity of the reticulo-endothelial system by means of the congo red test. He found that following all major surgical interventions the reticulo-endothelial system is impaired. The degree of impairment of the storage capacity corresponds to the extent of the surgical intervention, for the more extensive the operation the slower the disappearance of the dyestuff from the blood. However, the condition of the circulation does not seem to influence the reticulo-endothelial system.

Blood Transfusion in Treatment of Malignant Diphtheria.—The extreme painfulness and the high mortality rate of malignant diphtheria, and the inefficacy of the various treatments that have been recommended for septic diphtheria induced Benedict to try blood transfusion. He describes the technic by which he administered from 400 to 500 cc. of blood, and he states that he also administered diphtheria serum, although in smaller quantities than are usually administered during the severe cases of diphtheria. He employed blood transfusion in nine children with severest, malignant, pharyngeal diphtheria, in all of whom recovery seemed improbable, but seven recovered completely. Complications were not entirely prevented by blood transfusion, but it should be considered that they are likely to occur even in mild cases of diphtheria. However, it was noticeable that the postdiphtheric paralysis, if it occurred at all, either disappeared in a surprisingly short time or developed extremely late. Cardiac complications were not observed in any of the children who recovered following the blood transfusion. In discussing the action mechanism of blood transfusion he points out that it is a complex intervention. He thinks that the mechanical factor, namely, the introduction of approximately 0.5 liter of fluid, is of some significance for the heart and circulation as well as for other organs, but it should likewise be considered that the blood contains a certain amount of diphtheria antibodies. In order to gain a better understanding of the rôle of the antibodies in blood transfusion, the blood of the donors was examined for the presence of diphtheria antibodies and it was discovered that one of the children who died had received blood with an extremely low antibody

content, whereas in the children in whom the blood transfusion was most effective the injected blood was found to have a comparatively high antibody content. The author admits that his evidence on the antibody content is not sufficient for definite conclusions, but he thinks that it gives pointers for further investigations. However, on the basis of the good results that he obtained with blood transfusion, he recommends it as the most effective treatment to date.

Münchener medizinische Wochenschrift, Munich

79: 1465-1504 (Sept. 9) 1932

Transitory Cerebral Symptoms as Result of Circulatory Disturbances. F. Hiller.—p. 1465.
Physiology of Aging. M. Flesch.—p. 1469.
Cause of Death While Bathing. Grassl-Kempten.—p. 1469.
*Thrombo-Angiitis Obliterans with Involvement of Abdominal Vessels. L. Norpoth.—p. 1470.
Heat Regulation and Action of Light. H. Malten.—p. 1473.
*Injuries of Tibial Collateral Ligament of Knee Joint. H. Regele.—p. 1474.
Severe Trophic Impairment of Cornea in Case of Arsphenamine Dermatitis. H. Säuferlin.—p. 1476.

Thrombo-Angiitis Obliterans with Involvement of Abdominal Vessels.—Norpoth, on reviewing the literature on thrombo-angiitis obliterans, discusses its history, etiology and pathology. He relates a case of abdominal thrombo-angiitis obliterans, a condition that he considers rare. A generalized thrombo-angiitis obliterans that had already been assumed on the basis of the clinical observations could be corroborated by the postmortem examination. For the successive exacerbations in 1927, 1928 and 1931, the anatomic substrate was likewise detected. However, the author considers it surprising that the abdominal manifestations occurred comparatively late, for the occlusions in the abdominal aorta and in the mesenteric vessels were older, but he thinks that up to the development of the acute gangrenizing intestinal processes the vascularization was still adequate, perhaps as the result of canalization of the thrombus or as the result of collateral circulation. The intestinal gangrene that involved the duodenum, jejunum, ileum and ascending colon was the result of complete closure of the superior mesenteric artery. The author stresses that in cases of thrombo-angiitis obliterans the possibility of spreading of the process should always be taken into consideration.

Injuries of Tibial Collateral Ligament of Knee Joint.—According to Regele the injury of the tibial collateral ligament is one of the most frequent injuries of the knee joint. In order to diagnose this injury the insufficiency of the ligament should be watched for and roentgenoscopy should be resorted to. The treatment requires prolonged immobilization of the joint in extended position.

Virchows Archiv. f. path. Anat. u. Physiol., Berlin

286: 1-252 (Sept. 5) 1932. Partial Index

Pathologic Histology of Nerves and Ganglions in Laryngeal and Pulmonary Tuberculosis. A. G. Filatowa and B. J. Lawrentjew.—p. 1.
Trophic Disturbances in Injuries of Dental Nerves. P. N. Kartaschow and L. M. Matweewa.—p. 11.
Congenital Absence of Both Spermatic Ducts in Case of Normal Urinary Passages. A. Priesel.—p. 24.
Internal Recklinghausen's Disease (Endotheliomas, Neurinomas, Gliomas, Gliosis, Hydromyelia). Ruth Katzenstein.—p. 42.
*Fibro-Adenoma of Accessory Mammary Gland on Right Labium Majus. R. Friedel.—p. 62.
Primary Endothelioma of Ocular Conjunctiva. K. Stojalowski and J. Stasińska.—p. 70.
Malignancy of So-Called Mixed Tumors of Salivary Glands. A. B. Kornblith.—p. 74.
*Scleroderma and Its Pathogenesis. H. Selye.—p. 91.
Papillary Hyperkeratosis in Region of Tongue, Pharynx and Tonsils. G. Gerstel.—p. 116.
*Early Acquired Contraction of Lung (Atrophy). S. Kreuzer.—p. 125.
*Pathologic Anatomy of Brucella Abortus Infection in Man. F. Wohlwill.—p. 141.

Fibro-Adenoma of Accessory Mammary Gland on Right Labium Majus.—Friedel describes the case of a young woman who had a pedicled tumor of the right labium majus. The tumor developed at the time of puberty and its tissue structure resembled greatly a fibro-adenoma of the mammary gland. The behavior of the fibro-epithelial tissues and their encapsulation speak for its benign character. The histologic examination of several extremely firm, wartlike structures in the skin surrounding the pedicle showed them to be extensive layers of sebaceous glands, which in some places were adjoined by sweat glands. The author points out that supernumerary mammary anlagen may occur outside the milk region proper. Some investigators consider these malformations as atavistic, while others reject this theory. The author thinks that benign tumors of the mamma, particularly when they occur in early life, usually originate from separated fetal portions of the gland. The early manifestation of the tumor and its development at the time of puberty, at which the normal mammary gland also receives a growth impulse, make it probable that the anlage for the supernumerary gland dates back to the fetal period. The wartlike structures at the base of the tumor pedicle are noteworthy because they are arranged so that it appears as if the true tumor had grown from their center. Thus they have in relation to the tumor an arrangement similar to the sebaceous glands of the mammary areola, for these structures on the areola contain only comparatively few accessory milk glands and consist primarily of sweat and sebaceous glands. The author is convinced that the presence of the wartlike structures at the base of the tumor is due to the same developmental disturbance as the tumor itself.

Scleroderma and Its Pathogenesis.—After giving a short history of scleroderma, Selye describes the three stages in the clinical course of scleroderma; namely, the edematous, the indurative and the atrophic stages. Then he gives a description of the pathologic anatomy, and following this he mentions the various theories of the pathogenesis: the vascular theory, the nervous theory, the theory that temperature, particularly cold, may cause scleroderma; further, the traumatic, the infectious and the rheumatic theory; also the thyroidal and suprarenal theories and various others. Then he describes experimental scleroderma and shows that by injecting extract of the parathyroids in young rats it is possible, under certain conditions, to produce a disorder which clinically as well as morphologically corresponds to that of scleroderma and that in both instances the cutaneous manifestations are preceded by an excessive amount of parathyroid hormone in the organism. But he emphasizes that hyperparathyroidism cannot be considered a disease entity, since there are various forms of hyperparathyroidism. The presence of excessive amounts of parathyroid hormone produces a predisposition from which, under various conditions, entirely different diseases may develop. These observations are significant for the treatment of disorders that are recognized as hyperparathyroidism.

Early Acquired Contraction of Lung (Atrophy).—Kreuzer first gives a short description of the essential differences between deficient development of the lung and atrophy of the lung. He then relates a case of pulmonary atrophy in a woman, aged 65. From the anatomic observations it can be determined that the contraction of the lung was secondary and that it was one of those rare cases in which the atrophy began early; but whether the atrophy began during the fetal period or early in life cannot be definitely decided.

Pathology of Brucella Abortus Infection.—Following a review of the comparatively small literature on the pathologic anatomy of Brucella abortus infection in man, Wohlwill relates his own studies, particularly the histologic studies on spleen, bone marrow, lymph nodes and liver, from a woman, aged 67, who died following disturbances that were diagnosed as Brucella abortus infection and pulmonary embolism. The histologic changes were peculiar nodular foci in the spleen, lymph nodes and bone marrow, and in the liver there were focal necroses with total destruction of cells. In comparing his own histologic observations with those reported by others, he noted considerable discrepancies; but he considers the nodular formations as the most characteristic for Brucella abortus infection. He accepts a proliferation of cells belonging to the reticuloendothelial system as the most essential factor. In the reported case, for instance, the changes in the spleen all originated in the reticulum cells. The author thinks that the nodules can be classified with the infectious granulation tumors but that it will require further observations to determine in what human organs these granulomas are most likely to occur. The postmortem examination does not reveal how the pathogenic agent of Brucella abortus spreads through the organism. In spite of the fact that swelling of the spleen represents one of the

most regular and obvious manifestations, the author does not accept as final the theory of some investigators, who think that the spleen becomes involved first and that from here the infection spreads by way of a thrombophlebitis through the portal vein to the liver. He thinks that the microscopic changes in man and animals are more indicative of a spreading by way of the blood stream, with reactions primarily in the reticuloendothelial system, but he thinks that a final decision has yet to be reached.

Zentralblatt für Gynäkologie, Leipzig

56: 2273-2336 (Sept. 17) 1932

Primary Localized Tuberculosis of Mesenteric Lymph Nodes. H. Guggisberg.—p. 2274.
Use of Colposcopy in Gynecology. E. Preissecker.—p. 2280.
*Death of Twins from Hemorrhage Resulting from Extrachorial Tearing of Vessels in Velamentous Insertion. A. Muschik.—p. 2289.
Intraperitoneal Hemorrhage Resulting from Erosion of Wall of Vena Iliaca Communis Sinistra in Suppurative Thrombophlebitis Following Attempted Criminal Abortion. T. Cordes.—p. 2296.
Modern Methods for Reducing Birth Pains. M. Wachtel.—p. 2298.
Ring-Shaped Tearing of Cervix During Confinement and Etiology of Central Ruptures of Cervix. L. Margulies.—p. 2305.
Significance of Calcium for Prophylaxis and Therapy in Obstetrics and Gynecology. M. Rodecurt.—p. 2314.

Death of Twins from Hemorrhage Resulting from Tearing of Vessels.—Muschik, after relating the clinical history of the case, describes the histologic changes detected in the ruptured vessel and its attached tissues. In the final evaluation of the case he expresses the opinion that the fatal hemorrhage of the mono-amniotic twins took place before the rupture of the membranes and was the result of extrachorial rupture of a vein because of its velamentous insertion. This is proved by the characteristics of the placenta, the membranous attachment of the vessels, the anemic condition of the twins and the clinical course. The histologic aspects indicate that the tearing of the vessel was not sudden. First the vascular wall became thin, but the defect was at first covered by fibrin deposits on the inside of the wall. The tearing took place by disjoining of the fibers on the thinnest portion of the wall of the protruding vessel. The tearing was favored by the deficient nutrition of the protruding portions of the vascular wall. The fact that the children were recently dead at birth and showed no signs of maceration corroborates the estimation of the time of hemorrhage. The tearing of the vessel cannot have been caused by excessive stretching of the pole of the ovum, and thus Frommolt's theory that the velamentously attached vessels do not reach the os uteri does not apply to this case. The vessels were likewise free from syphilitic changes. One may assume that the vein was torn when in the course of the uterine contractions during the period of dilatation there developed a displacement between the lower portion of the uterus and the amniotic sac. The blood could pass between the chorion and the uterine wall and was discharged unhindered by way of the vagina. Because of the common circulation, the second twin likewise bled to death. The prognosis of extrachorial tearing of the vessels in velamentous insertion the author considers as unfavorable, not only because the diagnosis is difficult, but also because even if the condition is recognized the child cannot be saved unless immediate delivery (forceps, extraction) is possible. He considers a cesarean operation of slight value for saving the child.

Norsk Magasin for Lægevindenskapen, Oslo

93: 929-1032 (Sept.) 1932

What Results Does Our Treatment of Fractures Give? Statistical Investigations on Fracture Material of Division II (Ullevål) from April 1, 1919, to March 31, 1927. S. Widerøe.—p. 929.
*Poliomyelitis in Iceland in 1924. S. Matthiasson.—p. 949.
*Further Experiences Concerning Postoperative Thrombosis and Embolism. P. Bull.—p. 957.
Selective Unilateral and Bilateral Pneumothorax. A. Tuxen.—p. 965.
Pernocton and Use in Surgery. C. Schultz and I. Moene.—p. 974.
*Isolated Occurrence of Venereal Granuloma. P. L. Rotnes.—p. 984.
Painful Os Tibiale Externum After Distorsion of Foot or Fracture of Process of Navicular Bone. I. Schjøth-Iversen.—p. 989.
*Causes of High Tuberculosis Mortality in Norway. R. Høyer Dahl.—p. 994.
Paroxysmal, Periodic Paralysis. E. Skouge.—p. 1007.

Poliomyelitis in Iceland in 1924.—Matthiasson says that while sequelae of poliomyelitis were seen in Iceland before 1904, poliomyelitis was not diagnosed until that year. From then until 1924, occasional lesser epidemics occurred in eighteen of the country's forty-eight districts. In 1924 the first grave epidemic occurred, with 463 cases reported and 89 deaths from respiratory paralysis. Frequently a physician was neither called in nor informed, but the number of cases reported affords an idea as to the distinct and the graver forms. Considering only 463, the incidence would be 4.6 per thousand inhabitants, a poliomyelitis morbidity unparalleled in the literature. The percentage of cases according to age groups agrees fairly closely with Swedish reports from 1921 to 1925. The incubation period was from three to ten days. In the author's district of 5,709 inhabitants the epidemic started with peculiar mild febrile disorders in children, lasting from twenty-four to forty-eight hours. After a week graver forms set in or developed from mild beginnings, becoming a distinct poliomyelitis. In the next three months definite paralysis was noted in forty-one patients and eighteen died, and probably at least 200 showed subsequent nervous disturbances or had the disease in an abortive form. In some instances improvement after a mild attack was followed after a few days by grave or fatal recurrence. In another district of 2,121 inhabitants, nine children aged from 1 to 13 died in the first three weeks from respiratory paralysis and seventeen had various other paralyses. In a third district with 953 inhabitants at least 30 per cent are thought to have been affected, with permanent paralysis in only two, and three deaths. The mild and the grave forms are believed to be manifestations of the same disorder. Methenamine orally in quite large doses was without apparent effect; Jonnson found that in suffocation attacks calcium chloride solution intravenously sometimes seemed effective. During the last twenty years there has been active communication between Iceland and other countries, and between the coast and the interior. The infection in 1924 is assumed to have come through carriers from foreign parts. Attention is called to the occurrence of the epidemic in fifteen of the eighteen districts mentioned, with particular intensity in the two with the history of lesser poliomyelitis epidemics ten years earlier, where theoretically an effective immunity could be expected; to the absence of spread, although the conditions seemed favorable, into districts where poliomyelitis had been unknown for thirty years, and to the yearly occurrence from 1924 to date of occasional cases, all without demonstrable connection, and practically all in the districts involved in 1924.

Postoperative Thrombosis and Embolism.—During the year beginning November, 1930, Bull applied abundant administration of fluids according to Nicolaysen in all operative cases with danger of thrombosis and embolism. Postoperative thrombosis and embolism occurred in 8.8 per cent of the 125 patients over 20 and in 10.4 per cent of the 106 over 30, which agrees approximately with his results previous to the use of this method.

Isolated Occurrence of Venereal Granuloma.—Rotnes asserts that his case is the second instance of venereal granuloma observed in Scandinavia. The source of infection is unknown. Treatment with antimony intravenously resulted in rapid recovery.

Causes of High Tuberculosis Mortality in Norway.—Dahl avers that the cause does not depend on more unfavorable living conditions in Norway than afforded in other countries, nor does the national resistance seem to be of especial significance. The main cause in his opinion lies in the absence of bovine tuberculosis and the consequent lack of mild immunizing infection in childhood.

Ugeskrift for Læger, Copenhagen

94: 897-920 (Sept. 15) 1932

*Case of Poisoning with Tetrachlormethane Used for Shampooing and for Cleaning of Clothing: Review of Application and Manner of Action of Agent. K. O. Møller.—p. 897.
Case of Injury of Liver Parenchyma After Protracted Medication with Salipyrin: Liver Function Tests. G. Teilum.—p. 903.

Poisoning with Tetrachlormethane.—On the basis of experimental investigations and of the several cases cited, Møller concludes that tetrachlormethane is of the same narcotic nature as chloroform and is somewhat more poisonous, but is not inflammable. If the poisonous character of the substance is designated on the label, together with a caution against use in closed or poorly ventilated rooms, its application as a cleanser for clothing is considered safer than the use of benzine; under no circumstances should it be used for shampooing.